Built-in refrigerator for your Vega

With Supercool LK33-12ACD-RC

We were fed up with our free standing 12/220V camping cool-box. Often we forgot to manually switch to and from 12V and 220V which meant we ended up with a flat battery eand many dark evenings! Storing the box under the forward Vee bunks also resulted in uncomfortable high temperatures coming through the cushions.

We wanted a fridge within easy reach and not in awkward locations like the cockpit locker. The ideal place is of course the ship's pantry. Building in a cool-box has its' problems as it has limited volume and the manual switching remains. In short: What has the yachting market to offer us in terms of a real fridge? The result of our search is written

below for those who want the best compromise. A tip in advance: Only attempt this job in the winter lay-up! If you are a real DIYer you will succeed but don't renovate the entire Vega interior and replace a new engine at the same time! Roll your sleeves up and get ready to start!

1. Create space by removing the starboard pantry top and the wooden inside panels. Precisely measure to ensure maximum use of the space. Remember to allow 10mm space for the wooden base, supporting the fridge (See Item 7). Dimensions given are outer-dimensions of the box with a 2mm margin for finishing. The volume is minus 50mm foam thickness on all sides. Make a template of the box where the insulation sheet for the base starts thus preventing it from being pushed out. Note down the dimensions on the insulation sheet and cut out with a fine handsaw or jigsaw. Do this outside so that sawdust does not cover you and the inside of your home.

2. Use 50mm extruded closed cell polystyrene foam (Dow Chemical). Expensive, strong, does not absorb water and surface damages does not influence insulation. Use tile glue to fix. Whilst drying adhesive tape is used to hold the polystyrene in place (at least 24 hours). Do not use soluable glues. Where smooth surfaces of the sheet are to be glued onto the crosscut ends then the smooth skin will have to be sanded (Grade 80 sandpaper) and ensure it is thoroughly dust-free.

3. Line the inside with a top layer of 2mm PVC sheet. Cut this approximately 8mm smaller than the exact inner dimensions of the foam construction. (Mark with a Stanley knife and break along the cut line). Apply tile glue with a glue spreader, place the PVC sheet and press firmly. After drying, seal with Sikaflex and smooth with a wet soapy finger.

4. To make the construction fit the Vega's shape and to maximize volume (appr. 10 litres) the PVC base sheet should be warmed at the correct place (use a Fan-heater or hot-air paintstripper) and bend to the correct angle along a sharp (table) edge.

5. Line the outside of the box, using tile glue, at the cooling armature side and the cupboard side under the sink with hardboard or thin plywood. This is for reinforcing and protection. Cut away a space at the outside according to the instruction of the cooling armature supplier. Mind the sloping shape of the opening, install the armature and drill 5mm screw-holes. Afterwards drill from the outside holes only 15mm deep to the diameter of the nylocks (self-locking nuts). Glue with Sikaflex in each hole on the outside with hard plastic joining plugs (the ones that kitchen cupboards are joined to each other with). Note: After building in, this space is inaccessible. Saw the stainless steel or copper bolts to the correct length (appr 50mm) and put the cooling armature in place temporarily for test purposes. Check if the bolts fit exactly from the inside with the armature fitted to the joining blocks.

6. If needed reinforce the corners of the fridge box with aluminium tape (Gaffertape or simular).

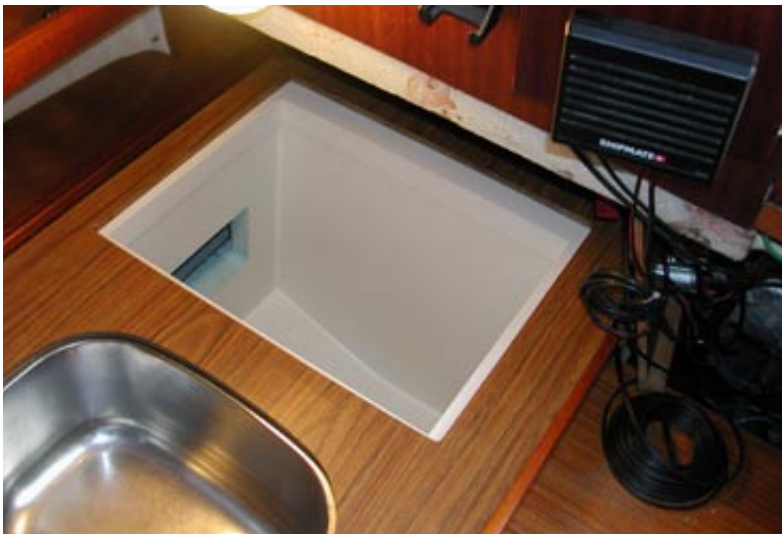
7. To the ship! Now the most difficult part: The box platform. Apply two wooden strips on the ship's inside hull approx. 10cm within the box dimensions. Mark the location on the ships hull side. Shape into the hull shape to obtain a perfect surface parallel to the pantry top. Same goes for the sloping backside. Attach to the wooden strips 10mm plywood the size of the box dimensions. Make it such that a perfect bearing platform is created on the ship's hull. It can be attached to the hull with polyester or be screwed on the wooden supports for easy removal if needed.

8. Drill 3 x 40mm holes as high as possible in the bunkside and cockpit locker-side for warm air outlets. Remove the bunk cover and drill a 100mm hole at the extreme aft under the bunk. Keep in mind space for the sink outlet and skin-fittings complete with valves. Through this hole comes the 100mm flexible PVC inlet pipe (same as for a laundry dryer since aluminium appeared not flexible enough) which draws cold air from the hull under the bunk (unfortunately cold air from the bilge is too far away).

9. Install the box in the pantry cupboard and fix to the three enclosed sides and at the bunk side by the two wooden blocks at the sink partition and cupboard partition under the sink bowl. If the box is placed at the correct height then a light pressure is obtained from the sink top which compresses the box slightly helping to keep it fixed. Finish the box's upper edge with joined PVC edging 50 x 50mm and glue with Sikaflex.

10. Fit the electric supply cable, remote-control cable and inlet pipe from the aftside through the armature cut out. Afterwards connect the cooling armature in the box with 12V. Fix the remote control and cold air supply hose with a hoseclip to the fan. Make sure you lead this through the cut-out under the bunk. Place the armature in the cut out and fix with the bolts. Now you can see the reason of the glued nylock nuts. Remove the old ledges from the lid under the cupboard top. Fit the cupboard top and other disassembled wooden parts. The fixed part is now ready.

The lid.



After finishing the cupboard part, the box forms a new ledge for the lid. In our case maximum space is used so the box is larger than the lid. That is why at both the aisle and galley side an extra foam edge is glued on the upper side of the box and finished with PVC edging. The edge at the back and bunkside is formed automatically. Measure the exact inner dimensions of the box edge and expect the corners not to be square! Note these dimensions at the lids' underside and mind the mirror image because you turn the lid around. Glue a sufficient large piece of foam with 2mm PVC sheet (be careful of the sanding of the extrusion side) and saw this to, exactly, the measured dimensions minus 1.5mm margin and 1mm thickness of the edging per side. Sides to be sanded with an electric sander.

Saw the angle joint then fix with tape to the insulation lid and try out in the box for correct fitting (ensure 1.5mm spare).

Glue the angle on the insulation lid with Sikaflex and let it dry. Sand the marked hard plastic sheet on

the underside of the lid to ensure correct adhesion. Make sure it is dust free then glue the plastic sheet to the insulation lid in the right place, again with Sikaflex. For exact fixing of the insulation lid to the box edge, tape 8 small spare angle pieces of 1 to 2 cm width as separators on the insulation side. Fill the box with sufficient cushions, to create enough pressure from the inside thus making sure the glue sets. The glued lid parts are adjusted automatically when placed in the opening. Press the lid by means of a weight between the protruding deck and lid. Next day, after removing the separators you will have an exact fitting insulated lid.

it is fully electronic you can have it remote controlled with a choice of various programs which react automatically to the battery voltage. As soon as the voltage of the engine or battery drops to a set level, the supercool switches to economy (from 60A to 7 A) and below appr. 12.2V it switches off automatically. So no empty domestic batteries after 10 sailing hours. Other advantages include the very simple building in, silent and almost non-wearing parts. Disadvantage is a fixed cooling differential of appr. 25C and therefore depends on supplied cold air. Cools slow. Price differences between compressor and Peltier systems are minimal. Both appr. € 450.- exclusive all coolbox materials. Total DIY costs are € 590.-. In short: Luxure. Check www.supercool.se.

Why supercool?

A personal choice. You may choose for example a Danfos compressor and cooling armature like your fridge at home. In that case you can install the compressor in the starboard cockpit locker next to the dustbin. Advantage: You can get things frozen and cooled faster.Disadvantage: More noise, less economical on battery power, needs more space

The supercool is fully electronically controlled by the Peltier armature and has only two small ventilators (PC-type) on each side. Because

Tips

* Make a cut out in the wooden basestrips, enabling (leaking) water to be lead to the bilge along the upright polyester edge in the Vega. (See 7)

* Place a piece of cookerhood-filter with a rubber band on the entrance of the cold air supply under the bunk. This way dust is caught, preventing it from coming into the non accessible ventilator.

* I have not made a water drain in the coolbox but made a small sump where the water collects and dry it once weekly. See instruction from Supercool.

* The remote control is placed in the cupboard on a piece of wood, glued on the ships's hull (epoxy or polyester). Accessible enough for service and does not disturb the interior with any existing electronics and cabling.

* Coolbox with flat bottom, less deep, and maximum length/width with 50mm thick insulation means a volume of appr. 69 litres. The deeper box contoured to the ships' hull shape has a volume of appr. 82 litres.

* To use maximum width I have replaced the wooden slats, attaching the sink to the cupboard's top, by a number of small stainless steel screws.

Enjoy the fresh products onboard especially the cool white wine and beer as you will need a drink after all this work!

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