



STORY AND PHOTOS BY DIANE SELKIRK

Insulating Against Condensation

(Or How I Kept My Socks Dry)

How to keep warm and dry when the weather is anything but

My first winter sailing weekend was nearly my last. It wasn't the sailing—who could fault spending the day sailing in an exhilarating 15-knot breeze, then later anchoring in a secluded cove? No, my complaint was with the frozen socks.

After crossing the Strait of Georgia from Vancouver in record time, we tucked into an empty anchorage and revelled in our good fortune. Here we were, anchored in the prime spot of a popular Gulf Island anchorage, with no other boat in sight. As the sun set and the temperature dropped we closed up the boat, turned on the heater and cooked a delicious dinner. Later, cozy in bed, we read by lantern light.

The next morning, I woke with a start. I was cold. Not just chilled by the cool air, but cold—as though immersed in icy water. I sat up and ran my hand down the quilt; it was sopping wet. The closer my hand got to my feet the colder the blanket felt, until I hit the unmistakable slickness of ice.

"My feet are frozen," I told Evan, with a not-so-gentle wake-up shove. He mumbled something about that being the plight of woman and rolled away from me, only to sit up suddenly and emit a sharp, high-pitched shriek. "You found the frozen part of the bed, didn't you?" I said.

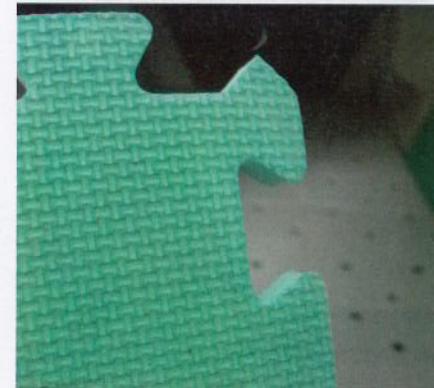
We both hopped out of the soggy bunk and started looking for clothes. I pulled a stiff shirt and even stiffer pants from my locker, but discovered that my socks were stuck to the hull. Peeling them off slowly, I marvelled over the ice crystals that had held my socks in place. Later, while warmed up over coffee, we sorted out where we'd gone wrong.

CONDENSATION BASICS A quick review of condensation basics confirmed we had pretty much done everything incorrectly. Warm air holds more moisture than cold air. So as we warmed up the boat, we added steam from cooking, humidity from the heater, moisture from our lantern and breath to the air. Then with the heater off, the air gradually cooled, the surfaces around the perimeter of the boat cooling first. The colder air couldn't

hold as much moisture as the warm air had, so water began to condense on the cold surfaces. When it got cold enough, the water froze.

My socks were probably one of the early victims of the condensation and freezing process, and by the time we woke up we also had frost on the inside of our windows and a clammy mattress.

I wanted to sail back to Vancouver and skip a second night under a wet blanket,



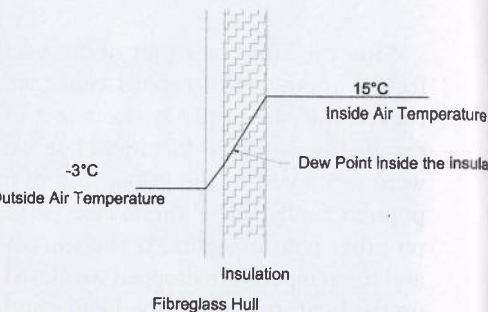
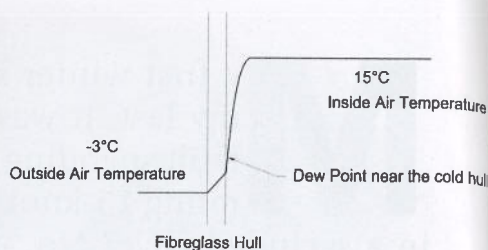
Interlocking closed cell foam floor squares make an economical insulation.

but Evan claimed that a few changes (courtesy of a quick visit to the hardware store in Ganges) would increase our comfort level. In the long term we would need to insulate the boat completely if we wanted to do extensive winter cruising, but for casual weekends aboard we could get by with a few basic preparations.

Before leaving the boat, Evan measured the hull sides and base of our bunk, then tipped up the mattress to dry it out. While Evan shopped, I took our clothes and bedding to the Laundromat for a run through the dryer. I met Evan as he made his way back to the boat with a curious array of items—everything from cedar lattice to blue camping foams.

INSULATION BASICS As he worked, Evan explained that insulation keeps a surface from becoming cold by modifying

SCOT RITCHE ILLUSTRATION



Evan's diagram illustrates how insulation reduces condensation by moving the dew point further away from the inside of the boat. The slope of the line represents the thermal gradient.

the thermal gradient. By insulating we were moving the dew point (the temperature at which the moisture in the air condenses) away from the inside surfaces of our boat. "Sure, but for somebody who isn't a mechanical engineer, what does that mean?" I asked. He sketched a diagram (seriously, he really does the diagram thing all the time).

The insulation's inner surface is warmer than the plain hull because the temperature changes from cold to warm through the insulation's thickness. Because cold air doesn't condense on the warm inside surface of insulation, we wanted to insulate the critical areas first.

We lined the hull side of our clothing and linen lockers with foam, carefully measuring each locker then pressing the foam into place. Next we did the same with the V-berth, lining the entire interior hull from the bunk to the deck. Because we managed to get a snug fit with the foam by simply pushing it in place, we opted not to glue it so it would be easy to remove in the summer months. As a final measure in coziness we laid out a few attractive carpets on the floor. These were actually bath mats—the size was right and the non-slip backing was an important detail.

If we were planning to be on the boat more than a few days we would have continued this process through the entire

boat, lining the rest of the lockers and exposed hull sides as well as more fully covering the floor with carpet or foam.

VENTILATION is also important in the fight against condensation, so our next goal was to get airflow under the mattress. Some great products are available that do this well, but we went for a low-tech version. We cut the cedar lattice to shape and laid the mattress on top of it. Not only did it provide ventilation, it also smelled nice.

Ventilation had proven to be our downfall the night before. We had cracked the hatch while we cooked, but closed it up again afterwards. It would have been better to continue letting the cold, dry outside air displace the warm, moist inside air.

That night we anchored in another silent bay. Dressed in warm sweaters, we watched the sun go down while sipping hot chocolate. Back inside, we left all our hatches ajar and used a fan while we cooked. The hatches stayed open through the night. I woke in the morning slightly cool but comfortable under our dry blanket. And my socks stayed ice-free. Our preparations were inexpensive, and the result opened up a new sailing season to us. 🌊

INSULATION TIPS

- For fiberglass boats, use 3M Thinsulate (closed cell extruded polystyrene), or flexible closed cell foam such as Evazote or Ethafoam, cut into strips for curved surfaces or left as a sheet for flat surfaces.
- The interlocking closed cell foam floor squares, often used for daycare centres, also make an economical and unique insulation.
- Insulation can be permanent or temporary. For permanent use, glue the foam on with contact cement. Consider lining lockers with cedar strips to protect the insulation.
- Don't insulate below the waterline—the ocean outside is just too big a source of coldness to prevent condensation.
- Steel or aluminum boats often have spray-on foam or fiberglass batts with a vapour barrier, just like a house. The batts are held on with insulation pins welded or glued in place. —DS