

WATER INGRESS IN A PVC FOAM CORE

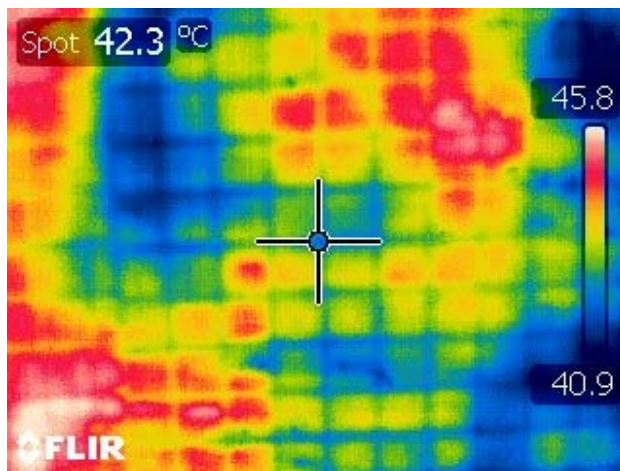
Problem:

During the installation of a new through-hull fitting in the hull bottom of a large composite vessel of sandwich construction, it was noted that the foam core material was wet. In order to obtain quotes for a repair, the Captain requested a through quantitative assessment of the affected area. Construction drawings indicated that the outer FRP skin had an approx thickness of 8 mm, with a 25 mm high-density (100 kg/m³) foam core.

NDE Limitations:

Conventional electronic moisture meters (contact type) could not be employed due to the generally high level of moisture contained in the thin layer of filler employed to fair the bottom area.

Shearography and other Ultrasound flaw detection methods cannot be used for this type of assessment. If the bond lines between outer / inner skin and the core material were suspected to be compromised then these techniques could have been employed.



NDE Solutions:

A quantitative Assessment was made and all area affected by water ingress were mapped using active Infrared Thermography.

It was further possible to determine that water ingressed the sandwich structure at a faulty through-hull fitting and migrated to other areas via partly unfilled kerfs.

Knowing the precise amount of area affected, as well as its cause, allowed owners / managers to make informed decision regarding the repair.

Blue areas (colder) in the Thermograph here above indicate areas saturated with water. Note channelling of water into kerfs of PVC core.