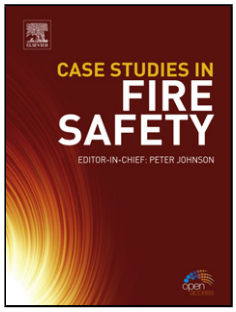


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# Durability of Fiber Reinforced Polymer (FRP) in Simulated Seawater Sea Sand Concrete (SWSSC) Environment

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Highlights:

- Moisture uptake of FRPs (except BFRP) followed: NC >SWSSNC >DW >HPC>SWSSHPC
- The presence of NaCl in simulated concrete led to a less FRPs moisture uptake
- Simulated high performance concrete solution leads to less degradation of FRP
- Greater basalt fiber degradation in SWSSC might due to the reaction of Al, Fe, and Mg with alkali and $Cl^-$ ions.
- CFRP exhibited the best durability in SWSSC, followed by GFRP and then BFRP

## ABSTRACT

This paper presents an experimental investigation on the degradation of carbon/glass/basalt fiber reinforced polymer (i.e., CFRP/BFRP/GFRP) exposed to simulated seawater sea sand concrete environments (SWSSC) at 25, 40 and 60 ˚C for 6 months. The presence of NaCl in simulated concrete environment was found beneficial for the moisture uptake of CFRP and GFRP. The greater fiber degradation of BFRP was attributed to its high aluminium, iron and magnesium contents on fibers. Further, FRPs showed greater degradation resistance in high performance concrete solutions that have a lower alkaline content. Thus, CFRP exhibited the best durability to simulated SWSSC environments, followed by GFRP and BFRP.