

Synopsis

Thesis Title : DEVELOPMENT OF BASALT FIBRE REINFORCED SANDWICH PANEL

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This study is towards the development of a composite material using basalt fiber as a reinforcement. Investigations were carried out towards the development of basalt fiber reinforced composite (BFRC) Sandwich panel. The use of basalt fiber towards development of sandwich panels will be investigated experimentally. There are two phases leaned for investigations. In the first phase, investigation were carried out to show the effect of basalt fiber towards the strength improvement. Mainly study will focus on different volume fractions of basalt ranging from 0.3% to 2%. Optimal volume fraction for basalt fiber was arrived at from the experimental investigation. The stress strain behavior of basalt fiber reinforced concrete was arrived towards finding the application potential of the composite under compression. Further the performance of basalt fiber reinforced composite was studied under tensile loading. In all the experimental work, accelerated curing was done which expediteates hydration reaction towards gaining strength soon.

In the second phase of investigation, design and development of sandwich panel using basalt fiber reinforced composite with suitable material to be used as flexural member was worked upon both analytically and experimentally. In lieu of present investigation, profile steel sheet was chosen as the suitable material for better composite action. Experimental investigations were conducted and suitability of BFRC Panel towards construction was studied in detail.

My research contribution toward development of Basalt Fiber Reinforced Sandwich Panel:

- Mix design for BFRC mix for M-50
- Characterization studies on BFRC mix and profile sheet for development of sandwich panel
- Development of Sandwich Panel
- Using Self-Tapping Screws as connection mechanism for composites.
- Construction methodology for making of panel.