

DEVELOPMENT OF COST-EFFECTIVE CEMENT-BASED CEILING SHEET WITH THE ADDITION OF WASTE FOUNDRY DUST

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Ceiling sheets are predominantly produced with the addition of asbestos; however, asbestos has been identified as a carcinogenic material. Hence, there is pressing demand for alternative materials to produce ceiling sheets. Waste Foundry Dust (WFD) is a byproduct of metal sand casting process, and there is no effective permanent solution for disposal of the WFD. In this study, the possibility of manufacturing cement-based ceiling sheets with addition of WFD is investigated as a low cost and healthy alternative for asbestos based ceiling sheets. Firstly, Ordinary Portland Cement (OPC) was mixed with WFD amount of 30%, 40%, 50% & 60% of total weight to prepare the material. Then, sheets were prepared using compression molding, by applying 2 tons per inch pressure. Also, another set of samples were made by replacing 3 wt% of cement with bentonite, with the same WFD amounts. A series of experiments were conducted to measure flexural strength, thermal conductivity, and water absorption of the prepared samples after 28 days of curing period. All the sample preparations and testing were done according to ASTM C-1185 standard. The results show that the strength and thermal conductivity decrease with increase of WFD while water absorption increase with increasing WFD. Here bentonite is used as binder to increase the binding property, hence improve the properties of prepared samples. WFD mainly acts as filler material to reduce the cost and reduce the adverse effect on environment.

Keywords: WFD, Ceiling Sheet