

## **DEVELOPING A VALUE ADDED PRODUCT USING LOW GRADE QUARTZ AS AN ALTERNATIVE FOR CERAMIC FLOOR TILES**

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Vein quartz is one of the main export minerals produced in Sri Lanka. Presently, there are several quartz mines operating in Balangoda, Matale, Embilipitiya, Badulla, Kaikawala and Anuradhapura areas, spreading over different districts. High grade grit quartz having a silica content over 99% produced by these mines are directly exported to different countries in the world. Subsequently, large quantities of low grade quartz have been stacked in these mines over many years. Presently, a total of 3-4 million tonnes of such low grade quartz remain in these mines incurring high capital cost. Hence, the objective of this study is to develop a value added product using low grade waste quartz as an alternative for ceramic floor tiles. Low grade grit quartz having silica content of 95% was graded into four particle size ranges as (0-2 mm), (2-4 mm), (4-6 mm) and (6-10 mm). Then, a total of 40 quartz floor tiles were prepared by varying quartz to cement ratios as 3:1, 4:1 and 5:1 and kept in a water bath for 28 days to harden. Prepared tiles were subjected to water absorption test and tensile test. Wear and tear of these tiles is still being experimented. Results reveal that the floor tiles produced using low grade quartz have low water absorption property with high amount of embedded quartz and has sufficient strength as same as typical concrete. There are more advantages of these floor tiles over typical concreting and tiling as these can be directly laid as a homogeneous material without keeping grooves unlike in normal ceramic tiling thus no grouting is needed. Therefore, this method is feasible in terms of cost as well. Since quartz has Mohs' scale hardness of seven and high heat absorption property, wear and tear of these quartz floor tiles is very low and give a natural cooling effect to an enclosed area. It may also be possible to have attractive colours using different colours of quartz and cement. Hence, producing floor tiles using low grade quartz as a value added product is recognized as a timely and profitable activity. Consequently, this can contribute to the national economy while benefiting both mine owners and users.

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