Establishing a Relationship between Silica/ Feldspar/ Ball Clay Content and Shrinkage Properties in Wall Tile Manufacturing

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The manufacturing of a walltiles contains the raw materials such as silica, feldspar, ball clay calcite, kaolin and tile grog. Silica content in ball Clay may vary from location to location. This variation may cause shrinkage problems while firing the tile body. Since ball clay is a plastic material and silica is not, higher the silica, lower the shrinkage will be. Yet the extent of the effect of silica content on shrinkage properties is unknown. The objective of this study was to establish a relationship between Silica/ Feldspar/ Ball Clay content and shrinkage properties of wall tiles. Homogenized master batch of raw materials were made by collecting the raw materials from the storage bins. They were dried in the oven to reduce the moisture. The indirect silica content of ball clay was measured by checking the residue. Different formulas containing different percentage of silica were prepared. The powder was then prepared by adding 6% of moisture. Two tiles from each formulae were pressed in the lab scale press (6 x 6"). The green tile size was measured using a Vernier caliper. The tiles were then fired in the biscuit kiln and the final size of the fired tiles were measured. Using the data collected from the above procedure, a formulae for shrinkage and silica/ feldspar/ ball clay content was derived. The standards and limitations were established.

Keywords: Wall tile, Silica content, Ball clay, Shrinkage