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The Effect of Glaze Rheology on Production Problems in Ceramic Tiles

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Ceramic glazes play an important role on the aesthetic properties and technical properties of the ceramic tiles. The lack of knowledge about the rheology of aqueous concentrated suspensions of ceramic glazes is a result of their complex systems. The suspensions have a large number of components, for which the final rheological behavior is the result of interactions of mechanical, electrical and chemical nature. However, the final aesthetic result of the glaze application on a support, independent of the glazing technology, is strictly connected with the rheological characteristics of the glaze slip. There are different glaze application methods such as bell and disc applications. Optimum rheological properties should be determined according to the type of application. It is inevitable to have surface defects such as holes and craters in glazes without proper rheological adjustments. Reduction in glaze viscosity is required as the applied shear rate increases. This study focused on the effect of particle size distribution and process additives on the rheology of wall tile glazes suitable for bell application. The studied glaze suspensions were prepared with the same solid content but with different deflocculant amounts. Types of process additions and mechanisms of deflocculation were determined. Surface defects were minimized depending on optimum rheological properties without changing the other production conditions.

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