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The effect of calcite additive on Clay for Ceramic tile manufactory

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Continues using for suitable raw materials in ceramic manufactory had caused a big shortage in the main resources for these materials. So manufacturer try day by day to find alternative material satisfy their demand. We aim in our research to support the industry by improving available raw material with artificial or natural additives, which affect positively on final product specification.

Many researchers have studied the important effect of Calcium carbonate on fine soils. They proved a reversal relation between calcite content in clay and its plasticity index. from this result, we focus on the changing in plasticity which is considered a very important property in ceramic tile manufactory.

The samples of clay have been chosen from some Syrian Clay sites. It were before, unacceptable soils in industry, because it doesn't achieve the minimum requirements for ceramic tile industry standards.

We have classified the soils according USCS after applying the essential tests on clay which include: mineralogy analysis, sieve analysis, chemical analysis and Atterberg limits. We have prepared the reference ceramic tile samples (without additive) and compared with other samples (with calcium additives from 5% up to 30%) by applying technical tests such as: water absorption, flexural strength, linear shrinkage.

We have achieved a remarkable improvement for original properties: flexural strength has increased in contrast water absorption has decreased. The best percentage for calcium carbonate additive is about 5% which ensure technical properties according with international standards. All changes on strength and shrinkage and water absorption value became stable after additive percentage 25%. The efficiency of additive correlates with soil composition, chemically and mineralogy.

We recommend to use calcite with percentage less than 5%, in the coming researches, probably this percentage will present important results. Also, using the calcite additives with a mixture of two types of clay soil, in order to study its effect on this mixture.