

# THE EFFECTS OF GRANULES BY PRODUCING WET&DRY PREPARATION METHODS ON WALL TILE MANUFACTURE

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## ABSTRACT

This work presents the results of a study concerning the effects of granules by producing wet&dry preparation methods on wall tile manufacture. Ceramic granule preparation is a critical process stage in the manufacture of ceramic materials formed by pressing. The widely used process in wall tile manufacture is the so called "traditional wet method" includes crushing of raw materials, milling, mixing in pool and spray drying. Spray dryer produces spherical granules excellent flowability. However, large amount water evaporation and the need to use only rheologically suitable clays are the drawbacks of processing.

Another approach for granule preparation is dry granulation process comprise crushing, dry milling, granulation and drying steps. The most important point is the particle size of the calcium oxide source. Our test results revealed that, the particle size must be under 30 µm, in order to prevent moisture expansion problem after firing. The crucial steps for dry granulation is granule shape, which directly effects flowability and deformation characteristics of the granules during pressing. Homogenous mixing of the ground raw materials is also important for obtaining required physical properties.

In this study, a recipe which was used for the production of wall tiles has been prepared by pilot scale dry mixing-granulation system. The physical properties of the wall tiles that were produced by this process were compared with the products from the wet system. It was found that homogenous dry mixing was possible with the dry system. Properties of granules, their pressing behavior and preparation of tiles produced both with dry and wet system are compared. It was observed that wall tiles produced by dry system had the similar technical characteristics to the formers. The potential water and energy saving for our particular production was 60% and 72% respectively.

**Keywords:** dry granulation, traditional wet method, granule, wall tile