

Hydrodeformation of unfired ceramic tiles: classification, causes and solution of the problem

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The manufacture of large and / or low thickness formats can produce the appearance of curvatures in the unfired ceramic tiles during the glazing and decoration process.

This curvature or deformation increases the probability to the appearance of cracks and in the extreme case, it can lead to the breakage of the unfired ceramic tile.

The current ceramic trend is the manufacture of increasingly larger and / or thinner formats, so it is very important to characterize the types of curvature, which are observed, and determine the causes and factors that influence the greater or less deformation, experienced by unfired ceramic tiles during the glazing / decoration process and in the boxes, before feeding the kiln.

In the glazing / decoration line, a certain degree of curvature, in addition to the appearance of cracks, can prevent the entry of the pieces in the digital decoration machines and in the boxes, very curved pieces will not be able to unload or will break during the unloading. This fact limits the time spent in the intermediary unfired stock and greatly affects the daily production planning.

A quantitative study of the degree of deformation (curvature) experienced by ceramic pieces during the glazing / decoration stage has been carried out and the factors that influence deformation have been analyzed, such as the amount of water absorbed, the composition of the ceramic composition or the microstructure of the support (apparent density and permeability).

The work ends by proposing a solution to minimize or avoid this problem, without the need to modify the ceramic composition or the grinding, pressing and glazing processes implemented in each factory.