

Hue variation on ceramic tile during the decoration stage by laser engraved silicon cylinders method

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Hue variation is a common problem in the ceramic tile industry. During the fabrication a considerable number of variables influence the hue of the final product. Despite the growth of the digital decoration in recent years, a considerable part of the ceramic tiles is still decorated by the more traditional technique using laser engraved silicone cylinders. In this scenario, the objective of the present study was to contribute to minimize the hue variation of ceramic tiles. To achieve this, the correlation between the viscosity of the ink and the geometric characteristics of the printed dots was studied. The variables related to the decoration process, ink characteristics (pigment, frit, medium and the proportion between them), type of cylinder, decoration machine, engraving, covering glaze, drawing to be decorated, equipment set ups and proceedings and test conditions, such as operation method, were fixed. The viscosity of the ink was varied and the geometric characteristics of the dots were evaluated using an image analyzer. The reflectance data were also obtained using a spectrophotometer device. In general the values measured for the reflectance, decrease with the increase of the viscosity, but there are cases where this variation shows an opposite behavior after a certain value of viscosity, which can be understood as a difficulty on the occurrence of ink transfer from the cylinder alveolus to the tile surface. As a conclusion, for each range of gray-scale values there is a range in viscosity that optimizes the ink transfer to the ceramic tile. In using images with wide range in gray-scale values, one should use a viscosity value that, in general, favors this transfer.