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# INFLUENCE OF CLAYEY MATERIAL ON THE SINTERING BEHAVIOUR OF CERAMICS CONTAINING PAPER SLUDGE AND GLASS CULLET

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**Abstract**

The sintering behaviour of industrial ceramics prepared using a previously selected mixture of incinerated paper mill sludge and glass cullet has been studied. The mixtures were prepared using 10, 20, 30 and 40 % wt of some natural clayey materials. Three natural commercial products were used: a red clay, a yellow clay and a kaolin. Mixtures of powders were blended by wet attrition milling, dried, sieved, pressed into tile specimens and then fired in an industrial roller kiln for 1 h at temperatures ranging from 1040 to 1140°C. The resulting materials were characterized by water absorption, shrinkage, hardness, bending rupture strength, crystallographic composition and microstructure. It was observed that all the materials containing kaolin reach good properties when fired at temperature greater than 1060 °C: the quantity of kaolin have little influence on their sintering behaviour. Conversely the optimal sintering temperature, and consequently the best physical-mechanical behaviour, of the materials prepared using red or yellow clay was found above 1080 °C . The final properties of the tiles are function of the amount and/or the specific composition of the added clays.

**Keywords**: paper mill sludge; glass cullet; clayey materials; sintering. mechanical properties.