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FAST FIRING OF GLAZED TILES CONTAINING PAPER MILL SLUDGE AND GLASS CULLET

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Abstract

The present paper reports on the results of some experiments on the progress of a previous research and describes the production, in single fast firing, of tiles containing 30 % wt of a natural red clay and a mixture of 42 wt % of paper mill sludge plus 28 wt % of glass cullet. Paper mill sludge (PS), produced in the course of paper production, is composed by mineral fillers, small cellulose fibres and organic compounds. Glass cullet (GC) are classified by CER (European Sludge Catalogue) as non dangerous products and are commonly used in various manufacturing activities, as glass reforming or melting additives for ceramics, mainly for its low melting properties.

The produced tiles were coated with a commercial “matt white” glaze and fired in an industrial roller kiln. Fired materials were characterized as a function of the top temperature (1090 or 1140°C) reached during the fast sintering process made in an industrial roller kiln. It is observed that tiles fired at 1090 °C display the best overall performances since the matt glaze well covers the substrate concurring to maintain in line with the official standard for production mechanical and physical properties of the tiles. The final products appeared well sintered and encouraging for industrial production.

Keywords: paper mill sludge; glass cullet; fast firing; tiles; glazing.