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REUSE OF THE RECYCLED NONMETALLIC FRACTION FROM WASTE PRINTED CIRCUIT BOARDS IN PAVEMENT INDUSTRY

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Abstract

The aim of this paper was to investigate the possibility of incorporation non-metal fraction (NMF) in concrete products as a substitute for aggregate on industrial scale, while other studies are mostly based on NMF incorporation in concrete only on laboratory scale.
Mineral filler was supplemented with 5, 10, 15 and 20 wt.% NMF from waste printed circuit boards (WPCBs) and its influence on concrete quality was assessed based on compressive and tensile strength conducted on laboratory and industrial scale samples. The efficiency of pollutants encapsulation from NMF incorporated in concrete products was determined by eluted elements, ions and chemical compounds such as As, Cd, Cl^-, Cu, Pb, Zn, SO_4^{2-}, DOC and TDS. Based on obtained results, it was determined whether is possible to incorporate NMF in concrete products on industrial scale. Finally, results showed positive outcome. Leaching test results imply that the procedure is acceptable from the environmental point of view, while at the same time, technical aspects showed loss in some mechanical properties.

Key words: concrete, non-metal fraction, reuse, sustainability, WPCBs

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