



Chemical-mineralogical characterisation of construction and demolition waste: the case study of Fenza Daniela plant.

E. Marrocchino, A. Toffano, C. Vaccaro

Earth Sciences Department, University of Ferrara, Italy (elena.marrocchino@unife.it)

Construction and demolition (C&D) debris have been considered for long time as waste and as such it, was mainly disposed to landfill. On the other hand, the growing pressure deriving both from the unsustainable use of natural resources and lack of land space for disposal, with consequent environmental impact, have resulted in the increased awareness of European Union countries. As far as it concerns Italy, re-utilisation of C&D materials is hampered by the scarcity of suitable plants for processing, as a result this resource is used as a lower quality materials for low grade application (i.e. road sub-base). In this study, different grain-size fractions, obtained by a grain-size sorting, from a C&D processing plant in Rovigo (NE Italy), were investigated through X-ray fluorescence (XRF) and X-ray diffraction (XRD) analyses, in order to evaluate their chemical and mineralogical composition, assisting in the development of improved recycling methodologies. This study indicates that, through an opportune crushing and sorting operation for C&D material, it is possible to obtain grain-size fractions with roughly homogenous chemical and mineralogical composition on each fraction. The homogeneity of the materials can be considerably improved if a careful differentiation takes place during the initial stages of C&D production (Poon, 1997; Poon et al. 2001). The finer fractions could be used for hydraulic mortar preparation only if the fraction of bricks, tiles and terracotta is prevalent, providing material with pozzolanic attitude (Baronio et al., 1997; Corinaldesi et al., 2002; Zendri et al., 2004). These recycled fractions could also be used in high grade application (i.e. starting materials for ceramics) requiring an industrial treatment (e.g., sintering process). Similarly, it could be also possible to reuse them in cement preparation, after suitable mixing with lime and subsequent calcination process.

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