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# ABSTRACT BOOK

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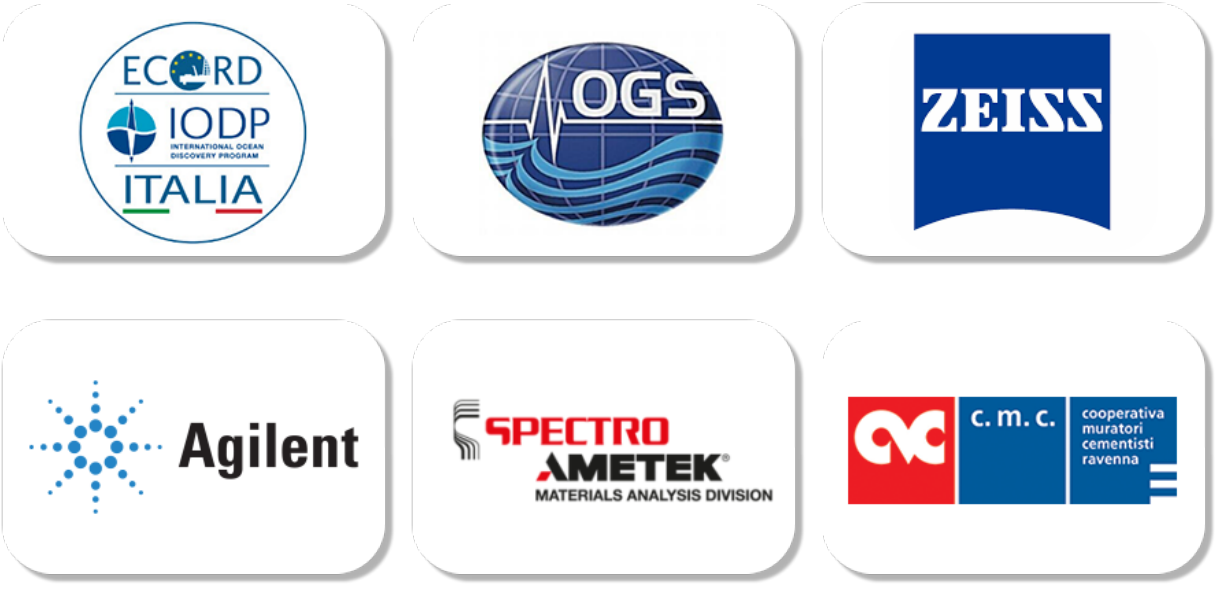


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# Degradation of mortars containing aggregate rich in serpentinites: the case of industrial brick masonry

Rizzo M.*[1], Sardella A.[2], Bonazza A.[2] & Vaccaro C.[1]

[1] Department of Physics and Earth Sciences - University of Ferrara
[2] ISAC-CNR - Institute of Atmospheric Sciences and Climate, Bologna

* *Corresponding email:* vcr@unife.it

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The risk of asbestos exposure (European Directive 1999/3/CE) is generally assessed for the C&D waste (Construction and Demolition), for the asbestos cement (eternit) used as building materials (plates, pipes, floor) and for the asbestos textile used for thermal insulation in the industrial sectors and in fire protection barriers. The evaluation of risk for dispersion of asbestos fibres in the atmosphere due to degradation of lime mortar containing aggregate rich in serpentinite is rarely analysed.

The aggregate containing fibrous minerals in light-weight masonry mortars was used in the industrial building of '900 to reduce the average density and thermal conductivity and to increase the physico-mechanical. The big development of constructions in the 20th century promoted the experimentation of innovative solutions to improve the performance of industrial buildings and in particular the industrial brick masonry chimneys and furnaces.

The use of sand rich in fibrous minerals is one of these innovative technological solutions. It was adopted in the beginning of the 20th century to realize the sugar factory that it was in use until 1968 and that is now the Technological Scientific Pole of University of Ferrara. That sugar factory is a symbol of the industrial history of the Po River Plain, so it is protected by the Italian Ministry of Cultural Heritage (Minghini et al., 2016).

As a result of the petrographic study of the mortars, they were classified as a mixture of lime and cement and an aggregate consisting of silicate sandstones, carbonate and fragments of ophiolite rocks (tholeiitic basalts and serpentinites). Considering the composition of the rocks and the geographic location of the sugar factory, it is possible that the sand was extracted in the Sillaro River area (Benini & Guasti, 1992).

The use of sand rich in fibrous minerals precedes the introduction of the filler and of the asbestos textile in the cements and mortars to improve their technological performance. The study of mortars has shown their high propensity to crack due to salt crystallization, frost stress and biological degradation, so the mortar durability is lower when they are deprived of the protective layer of the plaster.

Minghini, F., Bertolesi, E., Del Grosso, A., Milani, G. & Tralli, A. (2016): Modal pushover and response history analyses of a masonry chimney before and after shortening Engineering Structures, 110, 307-324.

Benini, A. & Guasti, M. (1992): Carta geologica dell'Appennino emiliano-romagnolo. Sezioni n. 238060 "S. Clemente", 238090 "Bisano", 238130 "Frassineto". Regione Emilia- Romagna, ufficio Cartografico. S.EL.CA., Firenze.