Editorial

Waste and building materials: What type of articles should be submitted to Waste Management?

An ever-increasing number of papers focusing on the use of waste as an alternative material in the production of building materials is being submitted to Waste Management.

Indeed, the wide variety of waste components available meets the requirements of an extensive range of construction materials. Wastes taken into account for the above purpose include fractions separated from municipal solid waste streams (e.g. glass, paper, plastic), residues from thermal treatment (fly ash, bottom ash, exhausted sands from fluidised bed incinerators) and special wastes (scrap tyres, C & D waste, WEEE, sludges) at times classified as hazardous waste.

The characteristics of the above-listed wastes indicate their suitability to carry out specific functions in the preparation of various products applied in the construction of roads, bridges, buildings and other civil engineering works. Therefore, varying degrees of these wastes may be mixed with cement, sand, tar, granulates and clay to obtain cement, mortar, bitumen, bricks, geopolymers, lightweight materials, etc.

This new sector is undoubtedly of interest to our journal in view of the numerous aspects relating to waste management and protection of the environment.

The recycling of waste in construction materials implies a significant reduction in amounts destined to disposal by landfilling, enhances the achievement of recycling rates established by law, leads to a reduction in the use of non-renewable resources, promotes closure of the material cycle with immobilization of elements (particularly heavy metals) that would otherwise have been available to the environment and produces a positive outcome on climate change both by acting as a carbon sink and through a lower consumption of fossil fuels.

Additionally, in several socio-geographical situations, conventional building materials may prove to be too expensive and not sufficient to face the worldwide growing need for housing development. Accordingly, the use of waste as alternative material may help to face the above shortage.

A diagram illustrating the relationship between waste and raw materials in the production and use of building materials is presented in Fig. 1.

Suitable wastes may be derived from the selection and treatment of municipal solid wastes or special wastes, or from industrial processes (coal ash, foundry sand, blast furnace slags, etc.).

The mixing of wastes with inert fractions to produce construction materials should be undertaken to improve functionality rather than merely dilute wastes. Only in this way will an effective waste recycling be achieved.

The materials produced must necessarily comply with technical construction (resistance, compression, etc.) and environmental requirements. In particular, potential pollutants present in waste should first be removed or immobilized to avoid the paradoxical situation whereby the undertaking of waste recycling with an aim to reducing quantities to be disposed of in sanitary landfills may result in the establishing of uncontrolled landfills constituted by the constructions themselves.

The cycle illustrated in Fig. 1 can ultimately be closed by means of the recovery and reuse of demolition wastes representing one of the main streams of special wastes, both from a qualitative and a quantitative point of view.

Therefore, papers dealing with the alternative use of waste in building materials involve numerous areas of scientific interest and technological applications representing two distinct fields: the field of waste management and environmental protection and the field of material science and building materials.

Scientific articles pertaining to both sectors are published in several authoritative journals. One of these is Waste Management, traditionally attentive towards issues including recycling, recovery of renewable resources, and sustainable development, together with others such as Cement and Concrete Research, also published by Elsevier.

The aim of the latter journal is “to publish the research on cement, cement composites, concrete and other allied materials that...
incorporate cement. In doing so, the journal will present: the results of research on the properties and performance of cement and concrete; novel experimental techniques; the latest analytical and modelling methods; the examination and the diagnosis of real cement and concrete structures; and the potential for improved materials."

Specifically, one of the fields covered by the journal focuses on applications for cement and concrete including waste management (www.elsevier.com/locate/inca/352).

It is obvious therefore that the Author of papers dealing with this borderline topic may ask himself “Which Journal should I submit my paper to?”, whilst the Editor may wonder “Which of these papers falls within the scope of my Journal?”.

With regard to Waste Management, we wish to clearly underline the policy applied on deciding whether a paper dealing with waste and building materials falls within the scope of the journal and is suitable for forwarding to the peer-review process, assuring that a suitable editor and well skilled referees are involved in the process. The latter is not an easy task for an out of scope manuscript.

The accent on waste management should be significant, considering the amount of waste involved, the possible role of waste in improving material properties, waste characterisation, the advantages to be gained in the field of waste management, in particular for problematic waste. Furthermore the focus on waste in the prospective manuscript should not be limited to a mere mention in the introduction.

There must be a scientific balance between the two fields. If the emphasis of the paper is on the properties of a material that contains waste, then it should probably be sent to a journal where the readers have expertise in the product and not to Waste Management. If the experimental approach, the key advancements and the references cited in the paper refer significantly to Material Science, then the paper will likely be better suited for submission to a journal in the above field.

The types of wastes of interest to Waste Management include municipal solid waste, special wastes (C & D waste, WEEE, tyres, sludges), agricultural and light industrial wastes that are in widespread use around the world. Coal ash, blast furnace slags, mining waste, marble and brick manufacturing residues, etc. are not within the scope of Waste Management.

To be considered for publication in Waste Management, the use of waste/building material should always be amply discussed and aspects such as the unacceptable release of contaminants or CO₂ emissions in the production, in the use or in the recycling phase should be addressed. Whenever alternative materials are used in applications that by nature imply exposure to the environment, the proper evaluation of environmental issues by means of adequate testing methods should be ensured.

Another important issue of environmental concern is the durability of products. Authors reporting on the use of alternative materials frequently forget that in developing concrete products extensive tests are performed to test durability of the end product.

In the same way as all other research papers, the uncertainty of the results obtained should be well addressed: a single measurement is not sufficient and will constitute grounds for the immediate rejection of the paper.

The originality of the paper should be clearly evident. The mere use i.e. of ashes, the running of traditional tests (compressive strength, tensile strength and flexural strength control, particle size analysis, etc.) is not enough to justify the interest of our journal.

Waste Management is of course interested in receiving papers dealing with the use of cement to achieve the inertization and stabilization of wastes in order to reduce their potential environmental impact. This same topic however may be of no interest to journals focusing on building materials.

To conclude, Authors submitting their papers for consideration of publication in Waste Management should first ask themselves the question: “Is my paper of interest to a Waste Management reader? Can the Waste Management reader understand my paper?”.

An honest answer to these questions will provide a useful indication of the potential for publication of the paper by our journal.

Raffaello Cossu
University of Padova, Italy

E-mail address: raffaello.cossu@unipd.it

Note: The views expressed in this editorial have been contributed and shared by the entire Editorial Team.