

EARTH SCIENCE, RECYCLING & SPACE TECHNOLOGY

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BIOGRAPHY

Anette Mueller worked as Full Professor for "Processing and Re-Use of Building Materials" during 1995–2011. She worked as a Senior Scientist at the IAB Weimar Institute of Applied Construction Research since 2011. She was the Visiting Professor at the University of Illinois Urbana-Champaign, US in 2001 and at the University of Sao Paulo in 2015. Her basic research projects and a large number of applied research projects had been proposed and processed during the time as Full Professor. Her recent research activities in the field of recycling of Construction and Demolition Waste are Recycling of heterogeneous recycled aggregates as raw material of lightweight aggregates; Carbonisation as tool to improve the properties of recycled concrete aggregates; Microwaves as tool for the liberation of connected building materials; Liberation and sorting of masonry rubble and Gypsum in Construction and Demolition Waste. She has more than 300 scientific articles in international and national scientific journals.

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RECYCLING-THE UNDERESTIMATED CHALLENGE

Construction is impossible without building materials. Thus, a building material history can be written parallel to the construction history. The first building materials were not or only mechanically modified natural materials with limited design and low structural engineering potential. Today building materials are needed, which are continuously developed driven by quality and environmental requirements. The innovative nature of the building materials industry is demonstrated by R&D spending, which mainly relates to process innovations and product innovations. An increase in both the number and the complexity of the building materials can be observed. The last life cycle phase, the recyclability, i.e. the potential for circulation is not considered and only used in some cases as a product feature. The traditional materials concrete and reinforced concrete are easy to recycle. After processing, they can be used as recycled aggregates or as road building materials. However, additional components or recipe developments may decrease the good recyclability. As examples very fine-grained concretes or concrete with fiber reinforcement can be named. Masonry materials like clay brick, calcium silica brick or aerated autoclaved concrete, which are the main constituents of masonry rubble, are the real challenge for the recycling today. Either these material mixtures will be sorted by sensor based techniques. Then the sorted materials can be used as partial substitute of the raw material for the original products or with respect to their special properties. As alternative possibility the unsorted mixture can be used as raw material for the manufacturing of lightweight aggregates by means of a thermal process. These aggregates can replace natural lightweight materials like pumice.