

The future of concrete

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Abstract

After a decade of intensive research into the recycling of End-of-Life (EOL) concrete into high-grade new concrete, largely supported by funding from the European Commission, it appears that a circular economy for concrete is techno-economically feasible. A collection of advanced technologies, in particular smart demolition for clean mono-flows of EOL concrete, new attrition and classification processes for removing the fine, moist-, lights- and cement-rich fraction from coarser aggregates, sensor sorters for removing larger pieces of wood, plastics and metals from recycle aggregate, green thermal treatment for concentrating and purifying the EOL cement paste and Laser-Induced Breakdown Spectroscopy tools for verifying the quality of input materials for the mortar facilities, have been put into place to make recycled concrete in some technical aspects even superior to concrete made from river gravel. And at competitive costs. Is this enough to make the transition to circular concrete into a success? Not necessarily. The integration of circular concrete into the routine of construction requires new procedures and agreements between stakeholders to avoid risks in producing an extremely cheap but at the same time strongly quality-guaranteed concrete commodity from a new and variable feedstock. It is argued that extremely tight quality checks should be installed in combination with a commitment of the entire chain to gently increase the fraction of recycled materials into new concrete as the EOL concrete flow grows as a consequence of phasing out buildings from the post-war boom.