Stainless steel slag waste as a replacement for cement in mortars

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Huge quantities of stainless Steel Slags are produced in several European Production Plants of this type of steel. Normally, these waste are moved to dumpfields, and minimum percentages are recycled. In the University of Cordoba the group of Construction Engineering have studied during last three years the feasibility of replacing cement by stainless steel slag waste and improving the mechanical properties of the slag waste by using different types of treatments.

The application of stainless steel slag waste could reduce the use of raw materials for manufacturing cement and provides a profit from the large amount of waste generated.

In these studies, we analyzed the cementation and pozzolanic reaction characteristics of stainless steel slag waste to evaluate its strength activity index and its environmental impact. The cement was replaced with different substitution percentages of untreated stainless steel slag waste and slag waste that was processed through crushing, burning and both treatment to determine the optimum replacement ratio according to its mechanical properties.

We determined that replacing cement with stainless steel slag waste for the manufacture of mortar could improve the mechanical properties up to a certain degree of substitution. This use can provide some value to the large amount of waste produced and reduce the consumption of raw materials.

Speaker Biography

Francisco Agrela is an Assistant Professor of Civil Engineering at the University of Cordoba, Spain. He received his Doctorate in 2003 from the University of Cordoba. He is the author of over 40 research articles in peer-reviewed journals. He has published a chapter in the Handbook of Recycled Concrete and Demolition Waste (Woodhead). He collaborates with several journals as reviewer, like Construction and Building Materials, Waste Management, Materials and Design, Resources, Conservation and Recycling, etc. He belongs to the RAC committee of RILEM and AFN-20 of TRB. He has visited and collaborated with several Universities like TU Delft, University Polytechnic of Hong Kong, University of Granada, IST of Lisbon, etc.

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