

# **RECYCLING OF WOOD ASH IN CEMENT-BASED CONSTRUCTION MATERIALS**

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## **ABSTRACT**

Wood ash is generated as a by-product of combustion from boilers at pulp mills, steam power plants, and other thermal power generating facilities. Since wood is a renewable resource for energy and an environmentally friendly material, there is an increased interest in using “waste” wood for energy production. As a result, there will be increased amount of wood ash generation. Currently, most of the wood ash generated in the USA, from pulp mills, saw mills, wood products manufacturers, etc., is either landfilled (about 70%) or applied on land as a soil supplement (about 25%). The cost of landfilling is increasing due to strict environmental regulations and limited availability of landfill space. Presence of some heavy metals and/or high-alkalinity in wood ash may limit its application on land under a stricter environmental regulation. In light of these, it is essential to develop beneficial uses of wood ash to meet the challenges associated with its disposal. Wood ash consists of two different types of materials: fly ash and bottom ash. Knowledge of the various properties of wood ash such as physical, chemical, and microstructural properties is necessary to establish beneficial applications for them. These properties depend upon several factors including type and source of wood, design and operating parameters of the boiler (especially combustion temperature), and ash collection methods. This investigation was undertaken with a view to understand various physical, chemical, and, microstructural properties of wood ash derived from various sources in the USA and Canada; and, to determine its potential applications in cement-based construction materials.