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Properties of Concrete with Wood Ashes in Construction Engineering

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Abstract : Many concrete technologists are looking for a solution to replace fly ashes as a component that occurs as a major component of many types of concrete. The importance of such a component is clear -it saves cement and reduces the amount of CO_2 in the atmosphere that occurs during cement production. For example, the amount of cement in ultrahigh strength concrete (UHPC) is approximately 700-800 kg/m³ in normal concrete up to 350 kg/m³. For this reason, it is easy to follow that the use of components like fly ashes or wood ashes protect the environment. The newest investigations carried out at the University of Stuttgart have clearly shown that the use of wood ashes with appropriate pre-treatment in concrete has a positive effect. German-wide, there are hundreds of tons of wood ashes, which can be used in a wide range of construction materials. The strengths of the concrete with different types of cement and with wood ashes have given the same or, in some cases, better results than those with the use of fly ashes. There are many areas in building construction, where the clays of wood ashes can be used as a by-product. This does not only require a strength test but also, for example, an examination of structural-physical parameters. Especially the heat and moisture characteristics have an important role in times of energy-efficient construction. These are therefore determined and then compared with the characteristics of the concretes with fly ashes. The University of Stuttgart has decided to investigate the buildings' physical properties of different types of concrete with wood ashes to find their application in construction. After the examination of the buildings' physical properties in combination with strength tests, it is possible to determine in which field of civil engineering, this type of concrete can be used.

Keywords : fly ashes, wood ashes, structural-physical parameters, UHPC
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