

# THE IMPACT OF FLY ASH AS PARTIAL REPLACEMENT IN CEMENT

**Denisa Demi**

Department of Industrial Chemistry, Faculty of Natural Sciences, University of Tirana, Albania, E mail: denisademi@yahoo.com

## **Abstract**

The incorporation of fly ash as partial replacement of Portland cement in production of blended cements is technically, economically and ecologically profitable. In the experimental part of this study, two imported (from Germany and Macedonia) fly ashes are investigated and used as Portland cement replacements. Both fly ashes are coming from the combustion of coal, classified as class F, with siliceous and aluminous content, with pozzolanic characteristics and without any cementitious property. Fourteen mortar mixtures are done with the incorporation of each fly ash. The amount of cement replacement by fly ashes was 0-35%. The experimental results showed that, both fly ashes are suitable for use in our country. Especially for German fly ash replacements, the mortars provided improved workability, long-term strength and durability in comparison with reference mortar mixture (without fly ash). This conclusion is important for the possibilities of using fly ash in our cement production. Fly ash may be used as a raw material for cement production, as an ingredient in blended cement and as partial replacement for cement in concrete. Sometimes, also, fly ash is used as partial replacement of fine aggregates as well as in the production of light aggregates for concrete. Generally, fly ash use in concrete provides cost savings, improved workability and pump ability, lower heat of hydration, improved ultimate strengths, reduced permeability, improved sulfate resistance and reinforcement corrosion prevention. On the other side, fly ash use in concrete results in gain of delayed strength, increased demand of air entraining agent and slightly reduced resistance to scaling due to salts used for deicing on concrete roads.

**Keywords:** *Fly ash, Portland cement, pozzolanic characteristics*