

# Environmental Properties of Fly Ash Bricks

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## ABSTRACT

Research conducted at Freight Pipeline Company sponsored by the National Science Foundation has found that fly ash bricks made by compacting Class C fly ash have good structural properties including freeze-thaw resistance, compressive strength, flexure strength, shear strength, and bonding strength, matching those of ordinary clay bricks and concrete bricks. The fly ash bricks also pass ASTM C62 requirements for clay bricks used for buildings in Severe Weather (SW) regions. However, because fly ash normally contains a small amount of pollutants including heavy metals, it was important to determine whether the bricks made by this method release pollutants back into the environment when being used on buildings, or when stored on construction sites.

Four most critical environmental concerns are: (1) potential for mercury vapor emission from the brick, (2) potential for leaching pollutants into ground caused by rain, (3) potential for polluting landfills when a building is demolished and the broken bricks enter landfills, and (4) radon emission from the brick. Each of these four concerns has been tested in laboratory. It was found that: (1) Fly ash bricks do not emit mercury into air. On the contrary, they adsorb mercury from air, making the ambient air cleaner. (2) Leaching of pollutants from fly ash bricks caused by rain is negligible. (3) Fly ash bricks pass the EPA-mandated TCLP test easily, and hence are "non-hazardous" for landfill or handling. (4) Fly ash bricks do emit radon gas, but only at 50% of that emitted by concrete. It is safe to use fly ash bricks whenever and wherever it is safe to use concrete in construction.

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