

STATE OF THE ART: FLY ASH, SILICA FUME AND SLAG UTILIZATION IN U.S.A.

By Tarun Naik, Shiw Singh and Viral Patel

Reference: CBU-1992-11

ABSTRACT

This paper presents the state-of-the-art information on the utilization of fly ash, silica fume and slag fume in various applications.

In this paper, fly ash uses are classed into three main categories: low technology applications; medium technology applications; and, (3) high technology applications. The low technology applications include the use of fly ash in fills and embankments, pavement base and subbase courses, subgrade stabilization, landfill cover, soil improvement, land reclamations, slurried flowable ash, water pollution control, etc. The medium technology applications involve the use of fly ash in blended cements, lightweight aggregates, concretes, prestressed/precast concrete products, concrete pipe, roller compacted concrete, autoclaved cellular concrete, bricks, blocks, paving stones, high-strength ceramic products, filler in asphalt mixture, artificial reefs, etc. The high technology application of fly ash include metal recovery, fillers for composite materials and other applications, mineral wool, etc.

Silica fume is available in several forms. Considerable amounts of research have been pursued on the utilization of silica fume as a construction material over the last decade. Typical properties of silica fume and its different uses in densified cement, blended cement, concrete, bricks, blocks, grouts, etc. have been briefly mentioned.

The use of slag in cements, concrete, aggregate, flowable backfills, grouts, bricks, blocks, and other applications have also been discussed.