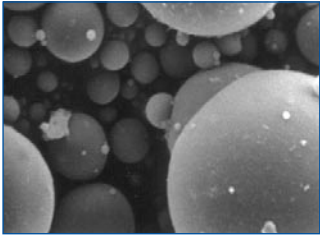


# COAL ASH

## FACT SHEET

### FLY ASH *What Is It?*



Coal is not all carbon. Coal contains quantities of non-combustible minerals. When coal is consumed to generate electricity, these minerals remain as ash products.

Fly ash is a fine, powdery material that would “fly” out of the power plant’s stacks if it were not captured. But power plants today collect their fly ash – and it can be a valuable tool in improving our environment and the quality of building products.

### ASH USE *Yesterday and Today*

The use of ash as a building material is not new. More than 2,000 years ago – long before the invention of portland cement – the Romans used volcanic ash to construct magnificent structures that are still standing today, such as the Pantheon.

Modern interest in using coal fly ash as a cementitious product began in post-war Europe. By the 1950s and '60s, power plants in the United States were collecting their fly ash and creating a number of beneficial uses.

Fly ash can be used in a variety of structural and low strength fill applications. It can be used as a mineral filler for paints, shingles, carpet backing and other products. It can be used in manufacturing mortars and stuccos. It even has various agricultural applications. But the largest application for fly ash is in the production of concrete.

### HOW FLY ASH WORKS

Concrete is the most common building material in the world. Concrete is primarily a mixture of aggregates (rock and sand), cement and water. Compounds in the cement react with water to form a glue that binds the sand and rock into a hardened mass.

When fly ash is added to the concrete mix, some of the cement can be eliminated. Mechanically, fly ash particles are small and spherical – allowing them to fill voids and provide a “ball-bearing” effect that allows less water to be used. Chemically, fly ash reacts with excess lime that is created

when cement is mixed with water, creating more of the durable binder that holds concrete together.

The result is concrete that is more durable and stronger over time than concrete made with cement alone. Some of the benefits of using fly ash in concrete include:

- Decreased permeability
- Increased long term strength
- Reduced damage from heat of hydration
- Increased resistance to sulfate and other chemical attack

### COAL FLY ASH

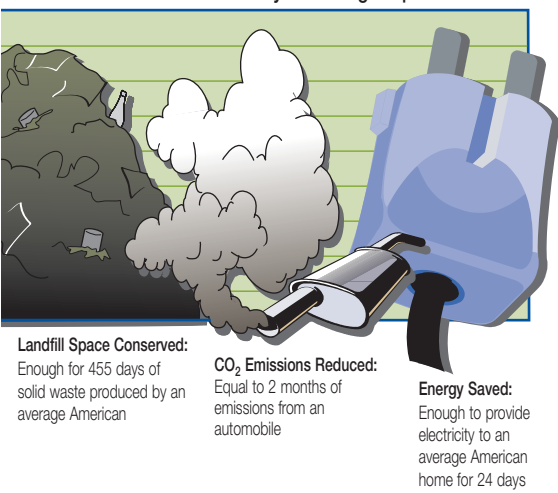
*A Resource for America’s Future*

Coal fly ash – produced at America’s electric power plants – is a valuable resource that cost-effectively improves the quality of many building materials while creating significant environmental benefits.



## AN ENVIRONMENTAL WINDFALL

Just One Ton of Fly Ash Usage Equals...



Using fly ash in concrete and other building products eliminates the need to dispose of the ash in landfills. When fly ash is used to replace cement in concrete, it has additional significant environmental benefits.

Fly ash use preserves natural resources by replacing materials that would otherwise be mined to manufacture cement. Additionally, cement manufacturing is a major contributor of carbon dioxide emissions to the atmosphere. For each ton of cement produced, more than a ton of CO<sub>2</sub> is emitted. By replacing a ton of cement production with a ton of fly ash use, that emission is eliminated. About 10 million tons of CO<sub>2</sub> emissions are being displaced annually in this manner today.

## OTHER COAL COMBUSTION PRODUCTS

In addition to fly ash, other coal combustion products (also known as "CCPs") can be used beneficially. Bottom ash – a heavier ash particle that falls to the "bottom" of power plant boilers – can be used in structural fill applications and as aggregate for manufacturing concrete blocks.

Flue Gas Desulfurization (FGD) material is produced by power plant equipment that scrubs sulfur dioxide from emissions. Much of this FGD material is a manmade, synthetic gypsum that can be used to make wallboard and other products.

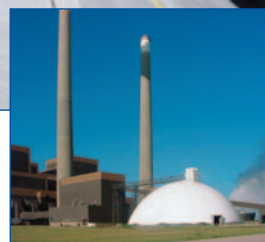


## WHAT WILL IT TAKE TO USE MORE?



About 37 million tons of coal combustion products are beneficially used in the United States each year. But more than 81 million tons are still being disposed in landfills.

America's power plants are investing in equipment and programs to collect, store and deliver ash products to the markets that need them. America's railroads are transporting ash products long distances, making ash available in areas far from the country's traditional coal regions.



Use of coal fly ash in concrete already has the support of a wide range of government agencies, including the Environmental Protection Agency, the Federal Highway Administration, the U.S. Army Corps of Engineers and the U.S. Bureau of Reclamation. Public and private entities can help by requiring the use of coal fly ash in their concrete and other building products.

*The American Coal Council (ACC) is the pre-eminent business voice of the American coal industry. The Association is dedicated to advancing the development and utilization of American coal as an economic, abundant and environmentally sound fuel source.*

### American Coal Council

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### The American Coal Ash

*Association's (ACAA) mission is to advance the management and use of coal combustion products (CCPs) in ways that are technically sound, commercially competitive and environmentally safe.*

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