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# Continuous Fiber Ceramic Composites (CFCCs) Improve Filter Life

CFCC filters are being evaluated for use in advanced coal-fired energy applications, where the exhaust gas goes directly to the gas turbine, and in chemical production.

Removing coal-ash particles from the exhaust gas of a coal-fired pressurized fluidized-bed combustor protects the gas turbine from damage, enabling the generation of energy with reduced emissions and with higher efficiency.

In tests conducted to date in the Department of Energy (DOE) CFCC Program, filters have shown excellent resistance to coal-ash attack at temperatures to 1800°F. These tests have been performed on both silicon carbide and oxide-based gas filters in plants at Karhula, Finland, for 580 hours, and at the Westinghouse Science and Technology Center in Pittsburgh. Current testing is under way in a coal-burning unit at the Power Systems Development facility of Southern Company Services in Wilsonville, Alabama.

In a cooperative program sponsored by DOE and Dow Corning Corporation, filters are being evaluated for use in chemical plants at temperatures to 1700°F. Testing is being performed at the Oak Ridge National Laboratory on several CFCC filters for use in dimethyldichlorosilane production.

These CFCC filters are currently under test at the Wilsonville, Alabama, test facility.

**BENEFITS:** CFCC filters provide improved reliability and resistance to thermal shock over monolithic ceramic components. They also offer significantly better resistance to corrosive attack than metal filters, allowing operation at higher temperatures. For advanced coal-burning power systems, such as pressurized fluidized-bed combustion, where the exhaust gas goes directly to a gas turbine, CFCC filters are enabling components.

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***In 1992, the Department of Energy initiated a 10-year joint R&D effort between industry, academia, and government to develop advanced ceramic composite materials for industrial applications. Continuous fiber ceramic composites (CFCCs) are lighter, stronger, and more damage tolerant than other materials available for high-temperature use. This cost-shared program will provide significant energy savings for industry and contribute to the economic prosperity of the United States.***

CONTINUOUS FIBER CERAMIC COMPOSITE MATERIALS