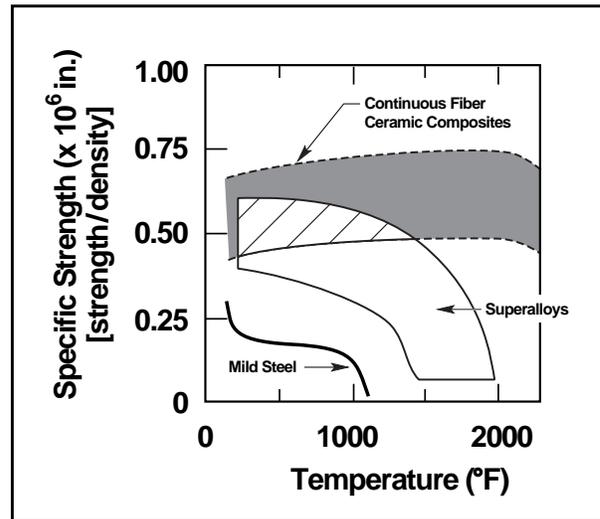


Continuous Fiber Ceramic Composite (CFCC) Pipe Hangers for Oil Refineries

CFCC components are candidates to replace high alloy steel pipe hangers supporting an array of pipes in petrochemical refineries. These hangers operate at temperatures to 2000°F and must survive the standard operating period of three years between maintenance operations. The operating temperature is close to the limit for alloy steel performance, and CFCC hangers can provide an insurance level of at least 300°F.

Under the Department of Energy CFCC Program, Dow Corning Corporation has been conducting coupon tests to evaluate long-term effects of exposure at temperatures to 2000°F in a refinery crude furnace unit. Tests of 4,400 and 8,500 hours duration demonstrated an acceptable durability of the CFCC materials. Dow Corning Corporation is currently looking for locations to install CFCC pipe hangers for evaluation in service.

The strength of CFCCs as a function of temperature is shown on this graph. Superalloys are limited to temperatures under 1800°F, while CFCCs are useful to at least 2200°F.



BENEFITS:

- The economic benefits of substituting CFCC hangers for metal components include the potential for substantial reduction of downtime and maintenance.
- Plant safety is increased due to elimination of catastrophic failures.

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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.

