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Carbon/Carbon Based Silicon Carbide Conversion For Friction Applications

Parker Hannifin Corporation, Aircraft Wheel and Brake Division approached the Pyrogenics Group to collaborate towards creating a new coating material to support the V-22 Osprey revolutionary new tiltrotor aircraft.

The V-22 is a fixed-wing plane with rotors that tilt so the aircraft can take off and land like a helicopter. The military sees it as potentially useful for long-range Marine Corps and commando missions. A tiltrotor combines the speed, range and fuel efficiency normally associated with turboprop aircraft with the vertical take-off/landing and hover capabilities of helicopters. The tiltrotor aircraft represents a major technological breakthrough in aviation that meets long standing military needs.

The tiltrotor brake pad and system must stand some of the harshest design criteria faced for an aircraft including hold and takeoff in support of mission operations and maneuvers on aircraft carriers and assault ships. The brake material must stand up to highly resistant wear, heat and fracture specifications and have a very high static friction coefficient.

The Challenge:

Develop a cost effective material coating that can withstand the severe operational conditions and longevity requirements of the mission planners for the V22 Osprey.

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The Results:

The Pyrogenics Group worked closely with Parker Hannifin in developing a unique SiC conversion process that satisfied the quality, performance, and schedule requirements set by the mission planners. The SiC thickness is on a carbon-carbon preform and uses a proprietary process employing high temperature furnaces. Unlike superalloys and ceramics, the resultant brake material is light weight, self lubricating, and retains its strength at high temperatures. In addition, it possesses a very low coefficient of thermal expansion (CTE), low residue, and withstands the thermal shock of the mission profile. The extremely wear resistant material makes it ideal for this application and as a friction material for high performance clutches and other brake applications.

Silicon Carbide offers very unique properties which include:

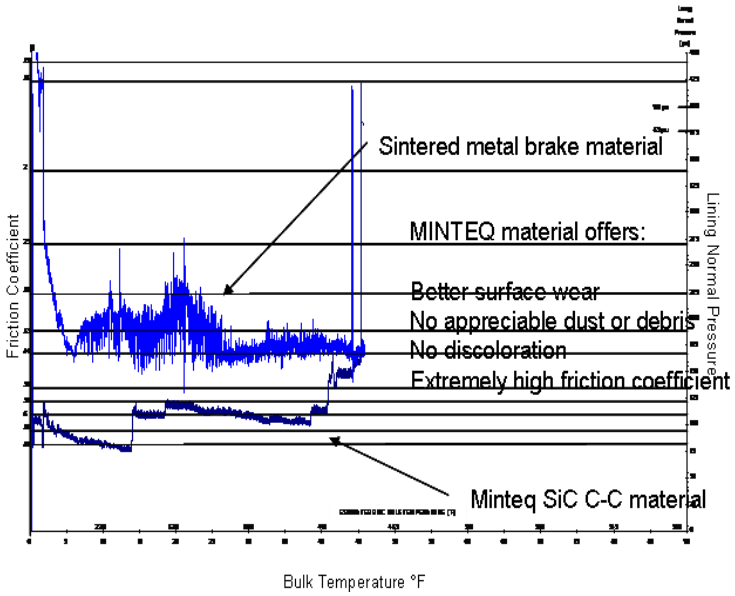
- High hardness next to diamond.
- Extremely wear and abrasion resistance.
- High flexural strength at room or high temperature.
- Excellent thermal shock resistance due to its low thermal expansion and high thermal conductivity.
- Excellent corrosion resistance.
- High temperature resistance.

Applications of C/C Silicon Carbide Products

- Couplings
- Clutches
- Hoists
- Winches
- Brakes
- Transmissions
- Mechanical drives
- Torque transmitters/limiters

For Details or Samples Call, FAX or Email

Toll Free: 800-962-8586 FAX: 610-250-3325



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