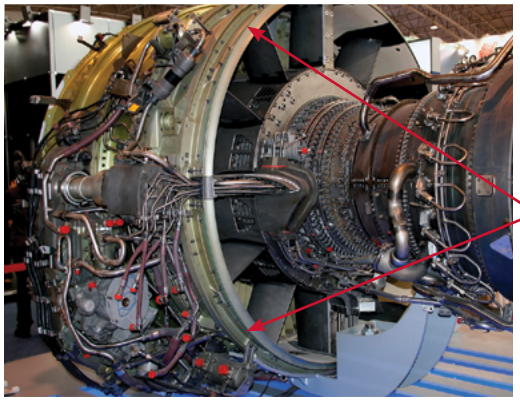
Application Profile

DuPont™ Vespel® CP-0664 Composite Wear Coating Adds Life to V-Grooves

Application

Jet engine designs utilize v-grooves to create air seals between the engine fan case and nacelle (Figure 1). V-grooves need to be durable to withstand corrosion and multiple impacts over the life of the engine.



Vespel® CP-0664 for v-groove coatings

Figure 1. V-grooves are utilized in jet engine designs

Challenges

- Major seal components are typically coated aluminum
- Coatings have to hold up to repeated impacts to avoid damage to primary metal
- V-grooves must be treated to prevent corrosion from exposure to weather and operational environments
- Components must be easily maintained in the field to maximize service time

Solution

- Vespel® CP-0664 is a unique composite fabric coating used in a variety of aerospace applications up to 400 °F/205 °C
- Material can be pre-formed to required geometries for bonding to critical surfaces
- Fabric provides low friction and durable coating to aluminum surfaces while creating a corrosion barrier

Features and Benefits

Wear resistance

Vespel® CP-0664 has seen extensive use in jet engine fans and nacelles and proven itself with years of service. Wear testing has been conducted over a variety of test conditions and proven to survive from 7,500 to more than 250,000 cycles. A transfer film is created on the mating metal surface which minimizes the wear on both the metal and composite surfaces (Figure 2).

Low friction

PTFE fibers enhance friction performance, dropping the dynamic coefficient of friction below 0.15. Higher loads only improve frictional behavior (Figure 3).

Shear strength/Impact resistance/Durability

Vespel® CP-0664 was subjected to 70 impacts with a dynamic load of more than 150 lbf with no visible damage to material or mating components.

Corrosion resistance

Vespel® CP-0664 has unique composite construction that creates an insulating barrier between mating metal surfaces.

Design flexibility

Material can be molded to match unique geometry of most v-groove designs. Parts can be easily bonded at initial assembly or in the field.

Protects expensive components from wear, extending life

A lot of aluminum coatings are brittle and can be easily damaged in use or experience corrosion with exposure to normal environmental conditions. Vespel® CP-0664 has demonstrated ability to protect larger engine components and fan cases from damage that can lead to costly repairs and removal of engines from service.

Solving a variety of problems

Vespel® CP-0664 has been used to solve a variety of problems. From v-grooves, fan blade roots, and door/cowl guides to track liners on thrust reversers. The versatility and durability allows you to think out of the box to solve wear and coating problems that are leading to costly repairs on major components.

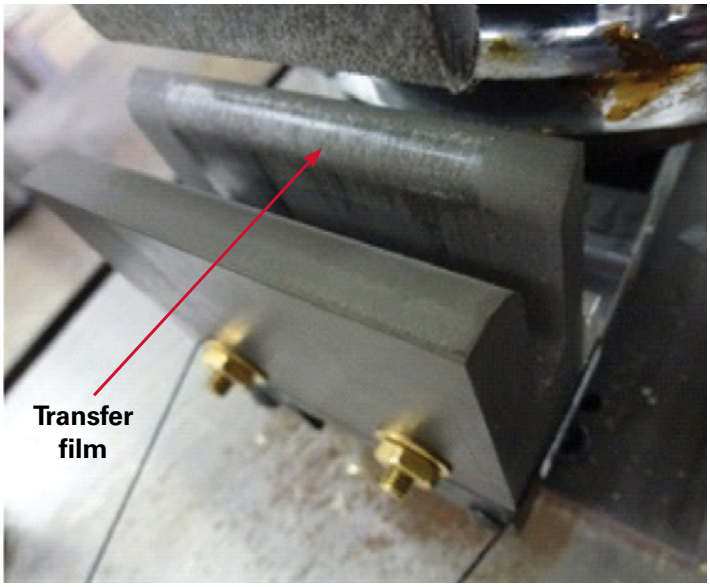


Figure 2. Impact/wear test fixture with transfer film on mating surface that reduces friction and enhances durability

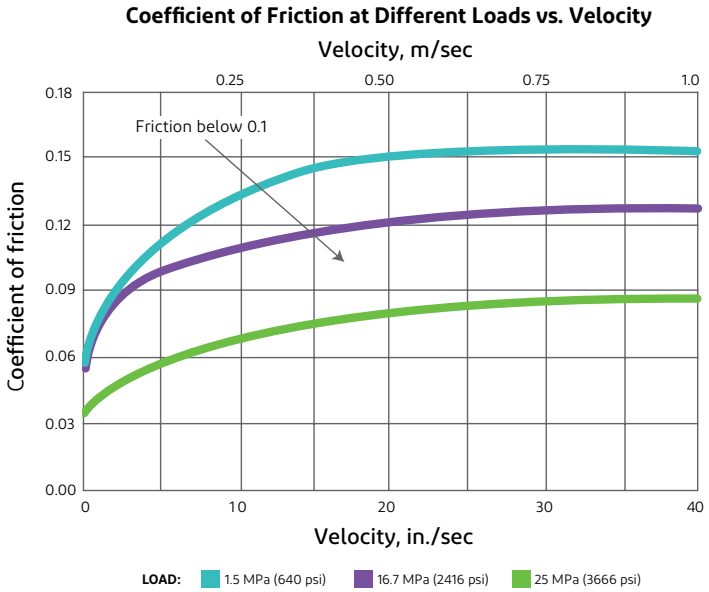


Figure 3. DuPont™ Vespel® CP-0664 Coefficient of Friction

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