

A photograph taken from inside a space station, looking out through a large circular window. The Earth's curved horizon is visible, with a blue atmosphere and a dark surface covered in city lights. A bright sun is visible on the left, creating a lens flare effect. Various mechanical components and structural elements of the space station are visible in the foreground and background.

thyssenkrupp Engineered Plastics

DuPont™ Authorized Distributor



DuPont™ Vespel® Parts and Shapes: Vespel® SCP Parts

Characteristics

- Low coefficient of thermal expansion
- Superior thermal oxidative stability
- Lighter weight than metal
- Extended part life
- High temperature resistance
- Reduced maintenance costs

APPLICATIONS

- Wear pads and strips
- Thrust Washers
- Bushings
- Bearings
- Bumpers
- Door mechanism
- Control linkage components
- Seals and insulators

DuPont™ Vespel® Parts and Shapes: SCP Parts Step Up to Take More Heat and Flight Wear

You can extend part life, reduce weight and costs by replacing metal parts and assemblies with DuPont™ Vespel® SCP-5050 and SCP-50094 direct-formed (DF) parts that can work in more demanding temperature wear environments than traditional polyimide components.

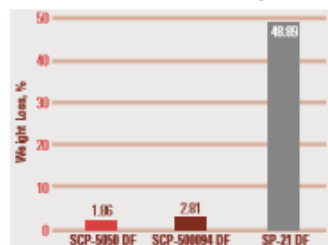


When the going gets hot...

There's an alternative to metal in aerospace and industrial applications where even traditional polyimides fall short in high temperature environments. Vespel® SCP-5050 and SCP-50094 parts combine a polyimide polymer with advanced filler technology. Vespel® SCP provides higher temperature resistance and a lower coefficient of thermal expansion than traditional polyimides. The filler technology reduces friction and dramatically improves wear resistance versus Vespel® SP-21 parts.

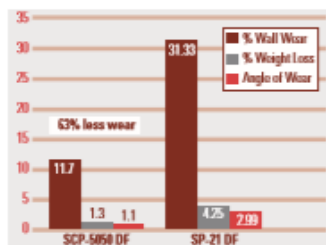
Superior heat stability

Fig. 1: Thermal oxidative stability, 100 hours at 371°C (700°F), 4.76 atm (70 psia)



More hot wear resistance

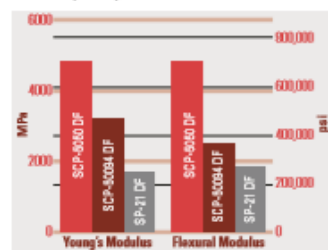
Fig. 2: Wear*, 500,000 cycles at 343°C (650°F)



*Oscillating wear tests of bushings with both axial and cantilever loads

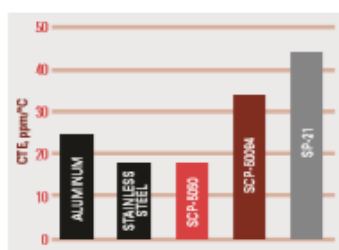
Stiff when hot

Fig. 3: Young's and flexural modulus at 260°C (500°F)



Metal-like dimensional stability

Fig. 4: Coefficient of thermal expansion



Extended part life

Thanks to their superior thermal oxidative stability (Figure 1) and wear resistance at elevated temperature (Figure 2), Vespel® SCP-5050 and SCP-50094 parts can last longer than traditional polyimides in high temperature wear environments.

Lighter weight

Vespel® SCP-5050 and SCP-50094 parts enable you to save weight by replacing metal in high temperature environments. Both provide greater stiffness than traditional filled polyimides at elevated temperature (Figure 2). Their low coefficient of thermal expansion (Figure 4) enables tighter fits and easier-to-manage tolerance stackups for your designs. The CTE of SCP-5050 parts is a near match for that of stainless steel.

Reduced costs

Replacing metal with Vespel® SCP-5050 or SCP-50094 parts can reduce both initial and lifetime costs.

- Lower initial cost than hard-faced or specially treated metal wear parts for parts like bushings.
- Less wear on mating high-value components—jet engine stators for example—can reduce maintenance costs.

Vespel® SCP applications

DuPont™ Vespel® SCP-5050 and SCP-50094 parts can deliver major benefits in aerospace and other industries.

Jet engines: Leading global manufacturers are already using Vespel® SCP-5050 and SCP-50094 parts for engine applications, upgrading the wear performance of traditional polyimide parts and replacing metal parts in high temperature environments where traditional polyimides have not been used because of previous temperature limitations. Typical applications include wear pads and strips, thrust washers, bushings, bearings, bumpers and more.

Other aerospace uses: The outstanding wear performance of Vespel® SCP parts can also provide benefits in aerospace uses where temperatures are less severe than engines. Examples include control linkage components, door mechanisms, bushings, bearings, bumpers, wear pads and thrust washers.

Other industries: Vespel® SCP-5050 and SCP-50094 parts are delivering cost and performance benefits in vehicles, as well as industrial equipment requiring higher temperature capabilities, wear resistance and dimensional stability than traditional polyimides and metal bearings.



In glass manufacturing, for example, they open possibilities for guide and holder components used in even hotter process areas and/or equipment where longer life components and improved uptime deliver benefits over graphite components.

For seals, insulators and more: An unfilled grade in the SCP series, Vespel® SCP-5000 uses the same base polyimide as SCP-5050 and SCP-50094. It delivers major benefits in applications such as insulators requiring dielectric properties or seals and valve seats needing enhanced high-temperature performance and chemical compatibility. To learn more, please visit <http://dupont.vespel.com> or contact the nearest DuPont location.

Let's talk

We have the right materials, technology and technical resources to help you design and manufacture superior parts and systems. Please contact the nearest DuPont representative for your country.

Our application specialists stand ready to assist you in designing your part.

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