



Rishon® Composite Properties

Rishon brand composite is based on the combined properties of a flexible fabric substrate (usually, but not restricted to fiberglass cloth) coated with a proprietary silicone rubber composition. Multiple layers are molded into homogeneous structures such as hoses, ducts, gaskets, sound and/or vibration dampeners, static and dynamic seals, piston rings, insulation and fireproof coverings.

The unique properties of the Rishon composite are:

Fire Resistance

Rishon is fireproof at the thickness of .027". Many parts made of Rishon have been tested to the FAA requirements of FAA FSSR453, which calls for a fifteen-minute exposure to a direct 2000° F flame without burn through or flame propagation. Rishon composite has also passed tests to FAA AC 20-135, which specifies a 2000° flame for 15 minutes while still fulfilling the operating design purpose.

Chemical Compatibility

Specimens of Rishon were exposed to nine fluids, as described in Material Specification Aero and Naval Systems STM-P-A105, Table 1. Sample specimens were submerged in each of the following fluids for 720 hours; Jet A1 fuel, JP-4, Skydrol 500B/4, propylene glycol, isopropyl alcohol, and Mil-L-23699 lube oil (Aeroshell Turbine Oil 500).

Sample specimens were submerged in each of the following fluids for 360 hours; Mil-C-87936 Type 1 Alkaline Cleaning Solution (Ardrox 6440 Exterior Aircraft Cleaner), methyl ethyl ketone, and 1,1,1-trichloroethane. After the exposure period, the specimens were visually examined for color change, softening, swelling, surface tackiness, blistering, and delamination.

In another test, Rishon was exposed to 'sour gas', a 5-7% by volume of H₂S gas. No deterioration was observed.

Temperature Range

Rishon composite seals are in use at temperatures ranging from -170°F to +850°F. Temperature spikes to +1100°F for four hours have been experienced without seal failure.

Another major advantage found in the Rishon composite is its behavior at high temperatures. Very little thermal change occurs with this material.

Seals tested at cryogenic temperatures (-320°F) have demonstrated impact resistance.

Integral Thermal Insulation

A .050" thick blanket of Rishon can provide about a 300°F drop in temperature. .090" thick blanket of Rishon encapsulating a silica laminate dropped the temperature about 600°F. The combination can be employed by bonding directly to metal ducting, or it can be added as an integral part of a flexible duct for maximum flex and minimum weight.



Sound and/or Vibration Attenuation

A .050" blanket of Rishon was tested and found to equal the sound attenuation provided by baffled aluminum- with a significant weight reduction. A similar test showed excellent sound reduction in aircraft engine enclosures.

Vibration analyses conducted by an airline company showed that Rishon did not transmit vibration – it muted and absorbed the vibrating energy.

Electrical Conductivity

Rishon ducting is in use in air management ducting systems on the 787 aircraft, where conductivity is a requirement. Rishon parts have proven to be reliable and weigh less than parts manufactured using traditional methods of providing conductivity.

Vulcanization

Rishon material bonds readily to most substrates using heat (300°F) for three minutes. Testing on untreated titanium required 80 lbs. pull to separate the Rishon from the metal substrate. The adhesive used for vulcanization is parent material in the B stage, therefore, no change in properties occurs.

Low Outgassing

Fully processed samples of Rishon have been tested by NASA, where it was determined that the Rishon samples tested released less than two micrograms of toxic gasses per gram of material.