

## Thermal Optical Properties\*

The optical properties of fibers on the exterior of the space craft controls the amount of solar heating that will occur in orbit. For instance, a low absorptivity would be desired if one were designing components for a spacecraft mission. This would reflect most of the sun's energy and protect the craft and the instruments from high temperatures.

Optical measurements were made on 3M™ Nextel™ Woven Fabrics 312 and 440 using a Gler Dunkle DB-100 Emissometer and MS-251 Solar Reflectometer machines. The average absorptance ( $\alpha$ ) and emittance ( $\epsilon$ ) are as follows:

Material	Absorptivity ( $\alpha$ )	Emissivity ( $\epsilon$ )
312	0.14	0.88
440	0.15	0.87

## NASA Nonmetallic Material Testing\*

Flammability, Toxicity and Thermal Vacuum Stability testing on 3M Nextel Woven Fabrics was performed using procedures specified in NHB 8060.1B and SP-R-0022A.

Flammability: Passed test in 30% oxygen and 10 psia environment.

Toxicity: Passed Test.

Thermal Vacuum Stability: Heat cleaned fabric passed test. Sized 3M Nextel Fabric out-gassed volatile condensable materials of 0.15%, which exceeded the required limit of 0.1 weight %.

\*Courtesy-NASA