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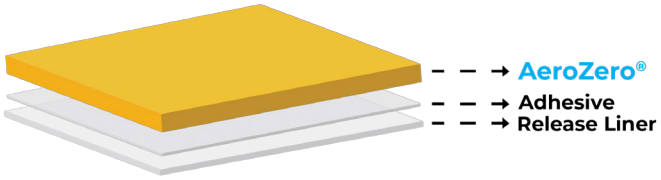
PRODUCT DATA SHEET

AeroZero® Thermal Protection Systems

AZ-TPS Low-Outgassing Configurations

Product Description

The AZ-TPS low-outgassing thermal portfolio consists of a range of tapes that include at least one layer of 165 micron (6.5 mil) AeroZero® polyimide aerogel film with at least one low-outgassing adhesive bonding layer. The adhesive has a release layer that is peeled off before application to a substrate. Potential substrates include stainless steel, aluminum, glass, carbon fiber, and polymer substrates such as polyimides, polyether ketones, polyurethanes, and polyesters. Typical use is thermal barrier/protection of parts in the Aerospace, Defense and Electronic industries.



Applications

Prior to peeling the release liner from the adhesive, ensure the surface is clean and free of loose particles. Standard application temperature is 25 °C (77 °F) and the recommended set time for optimal adhesion is 3 days prior to testing. The minimum application temperature is 10 °C (50 °F) and minimum set time is 24 hours before performing any tests. Increasing temperature and dwell time may increase adhesion strength.

Features

- Ultra-thin thermal protection system (TPS)
- Flexible application onto complex parts
- Enhances thermal performance of substrates
- Easy application with permanent bonding
- Flame retardant
- Lightweight

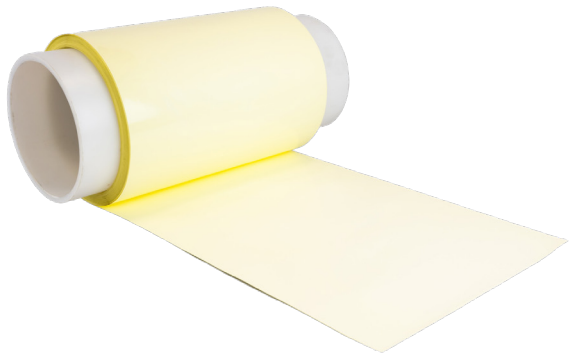
Standard Dimensions

- Test Sample: 216 x 356 mm (8.5 x 11 in)
- Sample Roll: 304 mm x 3.05 m (1 x 10 ft)
- Standard Roll: 304 mm x 30.5 m (1 x 100 ft)

Storage

Recommended Storage Conditions:

- Temperature: below 25 °C (77 °F)
- Relative Humidity: below 50%



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AeroZero® Thermal Protection Systems

AZ-TPS Low Outgassing Configurations

Physical and Mechanical Properties	Method	AZ-TPS 102 Value	AZ-TPS 104 Value
Product Code	-	2000-01A1-000	2000-01A3-000
Thickness, µm (mil)	ASTM D374/ D374M	223.5 (8.8)	190.5 (7.5)
Tensile Strength, MPa (ksi)	ASTM D882	6.5 (0.94)	7.5 (1.09)
Young's Modulus, MPa (ksi)	ASTM D882	200	250
Tensile Elongation at Break, %	ASTM D882	7.7	6.5
Density, g/cm^3	ASTM D202	0.50	0.40
Basis Weight, g/m^2	ASTM D202	105	78

Thermal Properties	Method	Value	Value
Thermal Conductivity (25 °C), W/m•K	ASTM C518	0.041	0.037
Thermal Conductivity (25 °C, 10^{-5} Torr), W/m•K	C177	0.007	0.008
Specific Heat Capacity (25 °C), J/g•°C	ASTM C1784	1.55	1.35

Thermomechanical Properties	Method	Value	Value
Glass Transition Temp (AZ T_g, DMA), °C (°F)	ASTM E1640	305 (580)	305 (580)
Decomposition Temp (10 wt% loss, TGA), °C (°F)	ASTM 2550	261 (501.8)	255 (491)

Additional Properties	Method	Value	Value
Adhesive Strength: 72 hour Peel Strength to 2 mil Aluminum Foil, N/m (Lbf/in)	ASTM D3330	>300 (1.7)	>300 (1.7)
NASA Outgassing Total Mass Loss (TML), %	ASTM E595	<1%	<1%
Collected Volatile Condensable Material, CVCM	ASTM E595	<0.1%	<0.1%
Adhesive Type	-	Acrylic	Acrylic

Data within this table are typical values for the standard AeroZero® TPS product family.
Product Codes #2000-01A1-000, 2000-01A3-000

AZ-TPS 102

AeroZero (AZ): 165 micron (6.5 mil)
Acrylic adhesive: 50.8 micron (2 mil)

AZ-TPS 104

AeroZero (AZ): 165 micron (6.5 mil)
Acrylic adhesive: 25.4 micron (1 mil)

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