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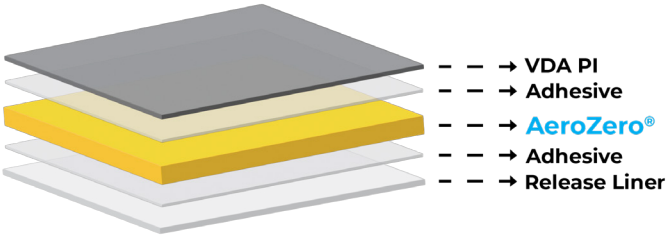
PRODUCT DATA SHEET

AeroZero® Thermal Protection Systems

AZ-TPS Vapor Deposited Aluminum Polymide 100

Product Description

AZ-TPS VDA PI consists of a 165 micron (6.5 mil) AeroZero® polyimide aerogel film with a 25.4 micron (1 mil) external polyimide film joined with a 25.4 micron (1 mil) adhesive. The polyimide film is coated with a highly reflective layer of 1000 Å Vapor Deposited Aluminum (VDA). The opposite side has a 25.4 micron (1 mil) adhesive layer for bonding to substrates. The adhesive is a high-performance engineering grade silicone pressure sensitive adhesive (PSA) with a release layer that is peeled off before application. Potential substrates include stainless steel, aluminum, glass, 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.



Application

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
- Easy application with permanent bonding
- Flame retardant
- High reflectivity
- Lightweight

Standard Dimensions

- Test Sample: 216 x 280 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 VDA PI 100 Data

Physical and Mechanical Properties	Method	Value
Product Code	-	2045-11S1-000
Thickness, µm (mil)	In-House Method	240 (9.5)
Tensile Strength, MPa (ksi)	ASTM D882-12	15 (2)
Young's Modulus, MPa (ksi)	ASTM D882-12	500 (73)
Tensile Elongation at Break, %	ASTM D882-12	9
Density, g/cm^3	In-House Method	0.60

Thermal Properties	Method	Value
Thermal Conductivity (25°C), W/m•K	ASTM C518-10	0.046
Specific Heat Capacity (25 °C), J/g•°C	ASTM C1784-20	1.18
IR Reflectivity (VDA-PI Surface)	ASTM E408-13	0.94
IR Emissivity (VDA-PI Surface)	ASTM E408-13	0.06

Thermomechanical Properties	Method	Value
Glass Transition Temp (AZ T_g, DMA), °C (°F)	ASTM E1640-13	305 (580)
Decomposition Temp (10 wt% loss, TGA), °C (°F)	ASTM 2550-17	410 (770)

Electrical Properties	Method	Value
Dielectric Constant (Dk) (10GHz)	Fabry-Perot Open Resonator (FPOR): 12-40GHz	1.92
Dissipation Factor (Df) (10GHz)	Fabry-Perot Open Resonator (FPOR): 12-40GHz	0.012

Additional Properties	Method	Value
Adhesive Strength: 180 °peel/3 day-RT dwell time AZ film on 50.8 micron (2 mil) Al Foil N/m (Lbf/in)	ASTM D3330	>300 (1.1)
UL Flammability Rating	UL94 VTM0	VTM-0
Adhesive Type	-	Silicone

Data within this table are typical values for the VDA polyimide TPS product family.
Product Code #2045-11S1-000

AeroZero TPS VDA-PI 100

VDA PI: 25.4 micron (1 mil)
Silicone Adhesive (PSA): 25.4 micron (1 mil)
AeroZero (AZ): 165 micron (6.5 mil)
Silicone Adhesive (PSA): 25.4 micron (1 mil)

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