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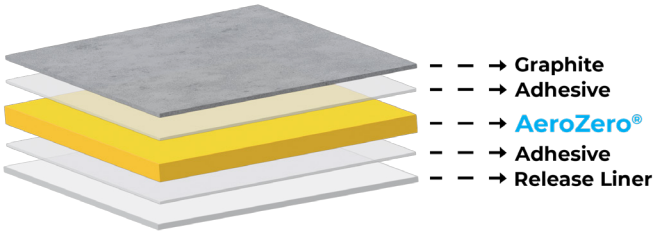
PRODUCT DATA SHEET

# AeroZero® Tape
## AZ-Graphite Tape

## Product Description

AZ-GR Tape consists of a 165 micron (6.5 mil) AeroZero® polyimide aerogel film with a 50.8 micron (2 mil) external graphite film joined with a 25.4 micron (1 mil) adhesive. The adhesive is a high-performance engineering grade silicone pressure sensitive adhesive (PSA) with 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.




## Application

Prior to peeling the release liner from the adhesive, ensure the substrate is clean and free of loose particles. Standard application temperature is 25 °C (77 °F) and the recommended set time for optimal adhesion is three 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)
- Excellent thermal insulator and heat spreader
- Lightweight
- Easy application with permanent bonding
- Flame retardant
- High heat resistance > 1000 °F (538 °C)

## Uses

- Launch vehicle protection
- Supersonic munition and aircraft
- High performance race cars and boats

## Standard Dimensions

- Standard Roll: 25 mm wide x 7.6 m long (1 in x 25 ft)

## Storage

Recommended Storage Conditions:

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

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| Physical and Mechanical Properties | Method | Value |
|---|---|---|
| Product Code | - | 5020-11S1-251 |
| Thickness, µm (mil) | In-House Method | 267 (10.5) |
| Tensile Strength, MPa (ksi) | ASTM D882-12 | 4.5 (0.65) |
| Young's Modulus, MPa (ksi) | ASTM D882-12 | 415 (60) |
| Tensile Elongation at Break, % | ASTM D882-12 | 4 |
| Density, g/cm$^3$ | In-House Method | 0.70 |

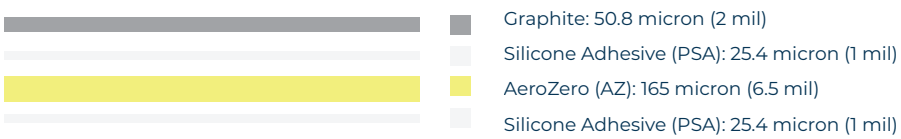
| Thermal Properties | Method | Value |
|---|---|---|
| Thermal Conductivity (25 °C), W/m•K | ASTM C518-10 | 0.053 |
| Specific Heat Capacity (25 °C), J/g•°C | ASTM C1784-20 | 1.07 |
| IR Emissivity (Polyimide Surface) | ASTM E408-13 | 0.85 |

| 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 | 470 (878) |

| Additional Properties | Method | Value |
|---|---|---|
| Adhesive Strength:<br>180 °peel/3 day-RT dwell time AZ film on 50.8 micron (2 mil) AI Foil N/m<br>(Lbf/in) | ASTM D3330 | >300 (1.7) |
| UL Flammability Rating | UL94 VTM0 | VTM-0 |
| Adhesive Type | - | Silicone |

Data within this table are typical values for the AeroZero® graphite TPS product family.
*Product Code # 5020-11S1-251*

**AZ-Graphite Tape**

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