



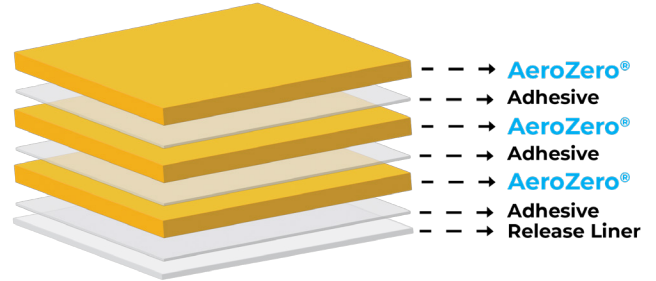
# TripleZero™ Thermal Protection System

## TripleZero™ TPS

### Product Description

The TripleZero™ thermal protection system (TPS) consists of three standard 165 micron (6.5 mil) AeroZero® polyimide aerogel films bonded 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 for bonding include carbon fiber composites, glass-reinforced composites, polymers (such as PEEK, polyimides, PET), and metals (such as aluminum, steel, titanium). Typical use is for thermal protection/insulation of battery housing and other sensitive parts exposed to high heat or very cold environments. Industries include aerospace, defense, medical and electronic devices.



### Standard Dimensions

- ◇ Test Sample: 216 mm x 280 mm (8.5 x 11 in)
- ◇ Starter Roll: 30.5 cm x 7.62 m (12 in x 25 ft)
- ◇ Standard Roll: 30.5 cm x 30.48 m (12 in x 100 ft)
- ◇ Available as sheets cut to custom sizes

### 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.

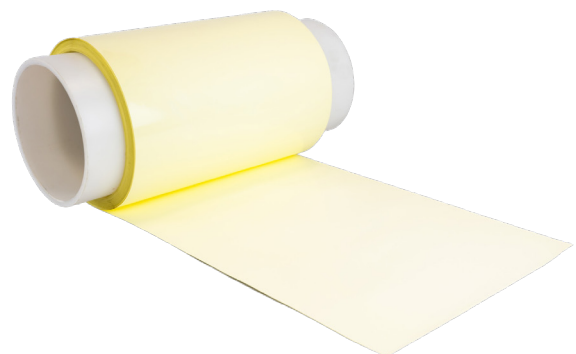
### Storage

Recommended Storage Conditions:

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

### Features

- ◇ Ultra-thin thermal protection system (TPS)
- ◇ Lightweight
- ◇ Flexible application onto complex parts
- ◇ Enhances the thermal endurance of protected parts
- ◇ Easy application with permanent bonding
- ◇ Flame retardant



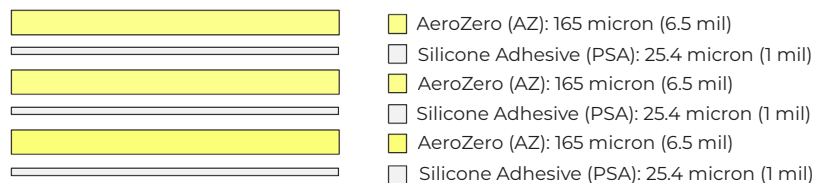
*Lighten. Protect. Perform.*



### TripleZero™ Thermal Protection System TripleZero™ TPS

Physical and Mechanical Properties	Method	Value
Product Code	-	2000-03S1-000
Thickness, µm (mil)	ASTM D374, Method C	570 (22.4)
Tensile Strength, MPa (ksi)	ASTM D882-12	7 (1)
Young's Modulus, MPa (ksi)	ASTM D882-12	200 (29)
Tensile Elongation at Break, %	ASTM D882-12	9
Aerial Density, g/m <sup>2</sup>	ASTM D202	230
Density, g/cm <sup>3</sup>	In-house method	0.40
Thermal Properties	Method	Value
Thermal Conductivity (25 °C), W/m·K	ASTM C518-21	0.036
Thermomechanical Properties	Method	Value
Glass Transition Temperature (AeroZero T <sub>g</sub> , DMA), °C (°F)	ASTM E1640-13	305 (580)
Decomposition Temperature (10 wt% loss, TGA), °C (°F)	ASTM E2550-17	400 (600)
Additional Properties	Method	Value
Adhesive Strength:		
180 °peel/3 day-RT dwell time AZ film on 50.8 micron (2 mil) Al Foil (lb/in)	ASTM D3330	>250 (1.7)
Flammability, 12 s vertical burn	FAR Part 25 Appendix F Part 1 (a) (1) (ii)	Pass
UL Flammability Rating	UL94 Vertical Burn	V0

Data within this table are typical values for the standard TripleZero™ TPS product family.  
Product Code # 2000-03S1-000



Blueshift products are manufactured under a certified AS 9100D/ ISO 9001:2015 Quality Management System facility. See our website for more information on Blueshift products.