

PyroThin™
ATB



Exceptional protection against thermal runaway with minimum thickness

As electric vehicle and battery pack manufacturers strive to increase driving range the space available in a battery pack becomes more and more limited. At the same time, mitigating the potential for thermal runaway propagation in lithium ion battery systems has become a key safety goal of regulatory bodies, vehicle manufacturers, and all other participants in the EV market.

PyroThin™ ATB technology is an exceptionally low thermal conductivity aerogel thermal barrier material, optimized for extreme thermal resistance during high temperature events. This allows PyroThin ATB to be an effective, passive, means to mitigate thermal runaway propagation at thicknesses as low as 2mm. The silica aerogel is engineered into a highly stable glass fiber reinforcement to produce a durable and flexible thermal barrier.

The exceptionally low thermal conductivity, and thin form factors, make PyroThin ATB thermal barrier ideal for placement between cells to help deliver precious minutes of protection against thermal runaway propagation.

PyroThin ATB thermal barrier may also be used to line the interior of a battery module, or used under the pack cover as a thermal and fire barrier to help protect vehicle occupants from the hazards of thermal runaway.

PyroThin ATB is available in two grades, PyroThin ATB1000, optimized to provide maximum thermal resistance, and PyroThin ATB2000, engineered to deliver enhanced compression performance.

APPLICATION EXAMPLES

Pouch Cells



Prismatic Cells



ADVANTAGES

- **Passive solution**
- **Exceptionally low conductivity and thin solution**
- **Thermally insulates cells to mitigate thermal runaway propagation**
- **Lightweight and thin format that adds minimal weight to the battery pack**
- **Accommodates charge-discharge cell thickness changes**
- **Resists physical degradation at high temperatures**
- **Does not sustain flame (UL-94 V-0)**

PHYSICAL PROPERTIES

THICKNESS*	2mm, 3mm
COLOR	Grey
HYDROPHOBIC	Yes

*Nominal Values

TYPICAL PROPERTIES

TEST METHOD	PROPERTY	PYROTHIN ATB1000	PYROTHIN ATB2000
ASTM C303	Density	0.20 g/cc	0.16 g/cc
ASTM C177	Thermal Conductivity	24 mW/m-K @ 0°C 26 mW/m-K @ 100°C 28 mW/m-K @ 200°C 30 mW/m-K @ 300°C 35 mW/m-K @ 400°C 43 mW/m-K @ 500°C 54 mW/m-K @ 600°C	25 mW/m-K @ 0°C 26 mW/m-K @ 100°C 28 mW/m-K @ 200°C 32 mW/m-K @ 300°C 36 mW/m-K @ 400°C 50 mW/m-K @ 500°C 61 mW/m-K @ 600°C
ASTM C165 MODIFIED	Compressive Resistance	8 kPa @ 10% Strain 90 kPa @ 25% Strain 200 kPa @ 40% Strain 310 kPa @ 50% Strain	14 kPa @ 10% Strain 81 kPa @ 25% Strain 159 kPa @ 40% Strain 257 kPa @ 50% Strain
UL 94	Test for Flammability of Plastics	V-0	V-0

Note: Values presented are typical and do not represent a specification.

PARTNER WITH US

For more than two decades Aspen Aerogels has been solving the most challenging and space constrained thermal and fire barrier problems for leading aerospace, oil and gas, and building material suppliers. Recognizing that lithium ion battery designs vary, Aspen Aerogels can engineer a thermal barrier based on your requirements, including:

- Alternate thicknesses
- Mechanical Properties
- Fabrication and encapsulation

Email us at thermalbarrier@aerogel.com for assistance with your application

THE AEROGEL ADVANTAGE

Aerogel is a lightweight solid derived from gel in which the liquid component of the gel has been replaced with air. The process of creating aerogel results in a material with extremely low density and the lowest thermal conductivity of any solid. These remarkable properties make aerogel one of the world's most efficient insulating materials. Our patented process integrates this unique aerogel into a fiber-battling to create flexible, resilient, and durable aerogel blankets with superior insulating performance.

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