

Product Information Sheet

FyreWrap[®] LiB Cell Spacers

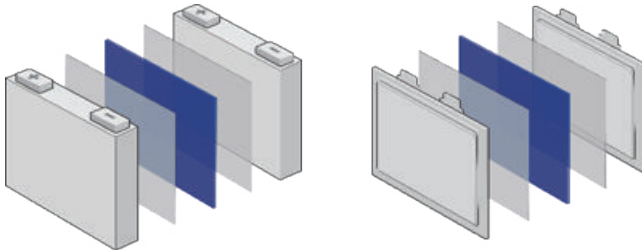
INTRODUCTION

FyreWrap[®] LiB Cell Spacers are a family of high-temperature, lightweight insulating materials designed to prevent and/or delay thermal runaway propagation while providing consistent and predictable pressures on the face of the cells over the lifespan of the pack.

FyreWrap LiB Cell Spacers deliver optimal mechanical performance by managing the pressures that occur during cell breathing from charge and discharge cycles as well as the irreversible swelling that occurs from cell aging. Utilizing Alkegen cell spacers within lithium ion battery packs enhances both battery performance and safety.

Pack safety is increased due to the low thermal conductivity of the cell spacers and high temperature stability. The FyreWrap LiB spacers are stable up to 1260°C and protect the pack by stopping or delaying thermal runaway propagation.

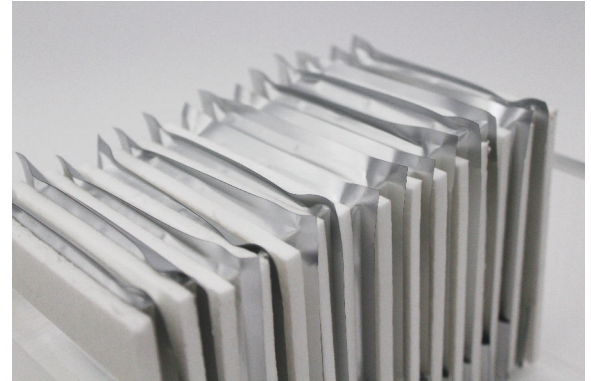
Alkegen Cell Spacers



PROPERTIES

- Flame barrier suitable for temperatures up to 1260°C
- Low thermal conductivity/thermal insulating
- Consistent and predictable pressure performance
- Electrically insulating
- Thin, light-weight, flexible and compressible
- Excellent chemical stability
- Uniform thickness and surface profile
- Additional enhancements available including adhesive, foil and film backings and/or encapsulation

As a vertically integrated manufacturer, Alkegen utilizes state of the art processing technology to produce a high temperature resistant, low density, thermally and electrically insulating cell spacer with consistent compression properties capable of managing the heat from a thermal runaway event as well as meeting every day mechanical performance requirements. Incorporating Alkegen cell spacers allows pack manufacturers to optimize both performance and safety in a dual purpose cell to cell solution.



SPECIALTY COATINGS

To enhance the usability of the FyreWrap LiB Cell Spacers for varying cell designs, performance specifications, and pack manufacturing environments, the base thermal barrier can be matched with materials that enable additional functional benefits. One such benefit is the ability to install the cell spacers in a highly regulated and automated manufacturing environment.

Layers such as Polypropylene, PET (Polyethylene terephthalate) or other similar materials can be attached via an adhesive ensuring a strong and lasting bond. This surface enables the cell spacer to be moved and fixed in place via vacuum transport and manipulation systems as well as enhances cleanliness standards.

Additionally, the cell spacer surface can be coated with an adhesive to create a tacky surface that prevents movement during the installation and manufacturing process should that be a specific requirement. The degree of adhesion can be tailored to meet specific needs even on difficult surfaces such as PE, PP and PET.

These solutions are easily assembled into the battery pack and are designed to fit within limited spaces accommodating both current and future pack designs

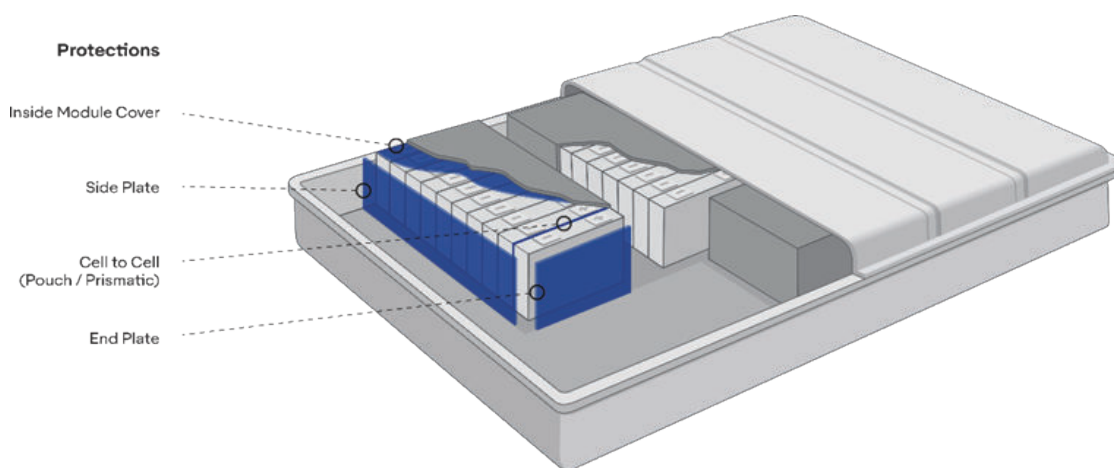
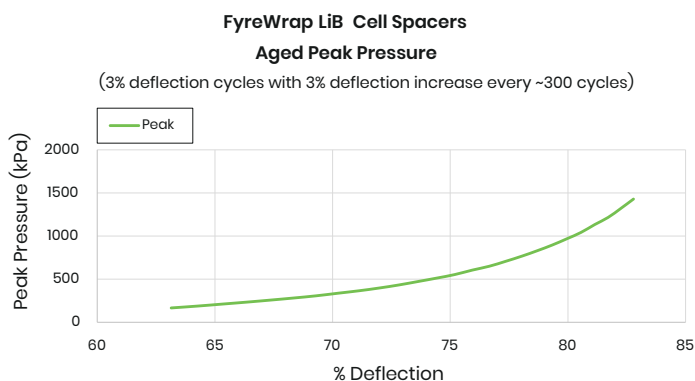
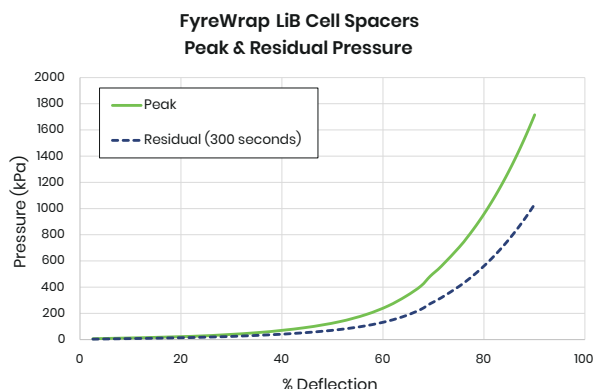
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FyreWrap[®] LiB Cell Spacers

TYPICAL PRODUCT PROPERTIES

Physical Properties – FyreWrap LiB Cell Spacer	
Color	White
Temperature Grade	1260°C
Density(kg/m ³) (Nominally within a range of)	120-200
Tensile Strength (kPa)	>350
Dielectric strength (kV/mm)-ASTMD149	9.45
Comparative Tracking Index (V)-UL746C, ASTMD3636-21	600

Thermal Conductivity (W/mK) – FyreWrap LiB Cell Spacer	
Mean Temperature	
200°C	0.05
400°C	0.08
600°C	0.11
800°C	0.15
1000°C	0.2



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The test data shown are average results of tests conducted under standard procedures and are subject to variation. Results should not be used for specification purposes. Product Information Sheets are periodically updated by Alkegen. Before relying on any data or other information in this Product Information Sheet, you should confirm that it is still current and has not been superseded. A Product Information Sheet that has been superseded may contain incorrect, obsolete and/or irrelevant data and other information.

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