

## FyreWrap® LiB Films

### Introduction

FyreWrap® LiB (Lithium-ion Battery) Film from Unifrax is a high-temperature, lightweight flame barrier and electrically insulating material designed to increase safety in lithium-ion battery packs. Based on proprietary fire blocking technology, the film was developed as a flame barrier for applications demanding extremely lightweight materials.

### FyreWrap LiB Film Features

- Fire resistant, flame barrier
- Electrically insulating
- Suitable for temperatures in excess of 1100°C
- Uniform lightweight flexible sheets
- Easy to wrap, shape or cut
- Fully heat-sealable with ultrasonic or thermal sealing equipment
- Designed for minimum moisture absorption and reduced installed weight

### Film Capabilities

- Aid in thermal runaway propagation prevention
- Short circuit prevention and electrical protection
- Cascading fire prevention
- Thermal isolation and containment

### Applications

- Battery Enclosures / Lids
  - Aluminum, Steel, Copper, and other metals
  - Composites
- Bus bars, current collectors
- Battery sub-components where high voltage electrical and fire protection are needed
- Packaging



### Material Properties

- Resistant to temperatures in excess of 1100°C
- Thickness: 0.2 mm
- Basis Weight: 100-200 g/m<sup>2</sup>
- Burst Strength: > 340 kPa
- Puncture Resistance (10 mm probe): > 50 N
- Permeance: < 0.2 perms
- UL94 V-0
- ASTM E1461 Flash Method Thermal Conductivity: 0.202 (W/m-K)
- Dielectric Strength ASTM D149-09 (2013): 700-800 (volts/mil) / 20 (kV/mm)
- 60 Hz Dielectric Constant ASTM D150-11: 1.97 DC 0.0087 (DF)
- 10 kHz Dielectric Constant ASTM D150-11: 2.08 DC 0.0071 (DF)
- Arc Resistance ASTM D495-14: 14.0
- Volume and Surface Resistivity ASTM D257-14:
  - Volume Resistivity: 5.36e+14 (ohm-cm)
  - Surface Resistivity: 1.07e+11 (ohms/square cm)

Please contact Unifrax for more information on FyreWrap LiB films and coatings along with any specific design requirements.