FyreWrap® LiB Films and Coatings

Introduction
FyreWrap® LiB (Lithium-ion Battery) Films and Coatings from Unifrax are a family of high-temperature, lightweight flame barrier and electrically insulating materials designed to increase safety in lithium-ion battery packs. These products are based on proprietary fire blocking technology specifically developed as a flame barrier for applications demanding extremely lightweight materials.

FyreWrap LiB Film Features
- Fire resistant, flame barrier
- Electrically insulating
- Proprietary fire blocking technology protects structures and substrates
- Uniform lightweight flexible sheets
- Easy to wrap, shape or cut
- Fully heat-sealable with ultrasonic or thermal sealing equipment

Film Capabilities
- Thermal runaway propagation prevention
- Short circuit prevention and electrical protection
- Cascading fire prevention
- Thermal isolation and containment

Markets
- E-Mobility
- Grid Storage
- Energy Storage Systems (ESS)
- Military
- Aerospace
- Consumer Electronics
- Medical
- Transportation packaging

Applications
- Cells (external to cell)
- Battery modules
- Battery packs
- Packaging for transportation

Material Properties
- Resistant to temperatures in excess of 1100°C
- Dielectric Strength (ASTM D149): 450-700 (V/mil)
- Thickness: 0.15-0.4 mm
- Basis Weight: 100-200 g/m²
- Burst Strength: > 340 kPa
- Puncture Resistance (10 mm probe): > 50 N
- Permeance: < 0.2 perms
- Heat Seal – T-Peel
  - Warp: > 9 N/25 mm
  - Fill: > 9 N/25 mm
  - Bias: > 9 N/25 mm
FyreWrap LiB Coatings

FyreWrap LiB (Lithium-ion Battery) Coatings from Unifrax are a family of high-temperature, lightweight flame barrier and electrically insulating materials designed to increase safety in lithium-ion battery packs. FyreWrap LiB coatings utilize the same core technologies as the FyreWrap LiB Films. The coatings are easily applied at room temperature in atmospheric conditions.

FyreWrap LiB Coating Application Study

FyreWrap LiB Coating was applied at a thickness of 8 mil (0.0203 millimeter) on an aluminum panel that was 0.019 inches thick. The panel is pictured below on the left.

The FyreWrap LiB Coated panel was exposed to a flame that was greater than 1000°C for 30 seconds. The aluminum panel showed no signs of deformation due to the flame protection provided by the coating technology.

The same set-up, shown below on the right, demonstrates the effects of not having the coating present on the panel. The flame melted the aluminum, causing a hole to form within eight seconds. The coating technology helps to maintain the structural integrity of the material while providing electrical protection in high-temperature environments.

Based on recent testing, it is believed that the coating can withstand direct flame impingement in excess of five minutes. To learn more about FyreWrap LiB coating technologies or to discuss your application, please contact us at 716-768-6305.

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