

BATTERY ENERGY STORAGE SYSTEMS

MULTI-APPLICATION PROTECTION SOLUTIONS FOR THE BESS MARKET



Challenges

- Prevention of cable entanglement and kinking
- Bending and abrasion
- Pinch points
- High dielectric stress and current induced heating
- Insufficient airflow between cells, causing thermal propagation
- Intense localized heat
- Prevention of heat transfer to cables routed close to heat generating components

Applications

- Cooling Lines
- Thermal Runaway Protection
- Busbars
- Cell Spacer
- HV & LV Cables

Experience

- Technical leadership
- Quick iterative design creation
- Customized testing
- Global manufacturing



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The impact of inadequate protection of coolant hoses in BESS can be significant, with downtime estimated at over \$10K per incident. Protective materials can reduce the probability of such events by close to 50%, making high-performance components a critical need. Systems Protection offers a range of solutions, from tightly woven sleeves that help prevent or dissipate leaks to thermal products that insulate hoses from high temperatures, positioning SP's sleeving line to meet the growing demands of BESS applications.



ProGard® 2631 / Sharp Edges and Pinch Points

- Operating temperature up to +125°C (+260°F)
- Enhanced abrasion resistance
- High coverage for maximum protection
- Fluid resistant



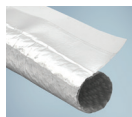
CrushShield® 2650 / Cut-through Protection

- Operating temperature up to +150°C (+302°F)
- Excellent cut-through resistance
- Color coded for high voltage identification
- Lightweight and flexible



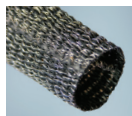
FyreJacket® 2611 / Heat Insulation and Fire Resistance

- Operating temperature from -54°C to +260°C (-65°F to +500°F)
- Fire protection up to +1100°C (+2012°F) - 15 mins / +800°C (+1472°F) - 30 mins
- Fluid resistant
- Easy installation



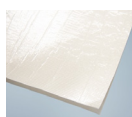
Therm-L-Wrap™ 26 / Heat Resistance

- Operating temperature from -60°C to +200°C (-76°F to +392°F)
- Self-wrapping sleeve with an adhesive closure offers excellent radiant and convective heat protection
- Unique design offers good flexibility not found in other reflective products



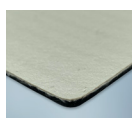
ROUNDIT® EMI 2601 / Electromagnetic Shielding

- Operating temperature up to +150°C (+302°F)
- Self-wrapping design
- Provides electromagnetic shielding
- Stable woven construction



Protexx-Shield® 2640 / Thermal / Electrical Insulation

- Flame Protection of +1000°C (+1832°F) x 10minutes
- Low voltage wiring in EV battery pack
- Efficient level of thermal insulation (+600°C / +1112°F)
- Customized designs for custom fit



Protexx-Shield® 2641 / Thermal / Electrical Insulation

- Thermal runaway survival +800°C (+1472°F) x 10 mins with no burn through
- Thermal Conductivity: 0.043 [W/(m*K)] at +23°C
- Withstands multiple cycles of blast exposure
- Customized designs for custom fit



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