S109

ContraFlame® S109 (formerly FlexiChar® Q57), is a cutting-edge thermal barrier material based on endothermic-ablative technology engineered to withstand extreme battery fire events. This “dry-fit” flexible very thin film exhibits exceptional resistance to erosion caused by high-velocity hot particles and turbulent flames. Specifically designed for application in battery module or pack housings, it offers robust protection for lightweight enclosure materials such as aluminium, steel, or plastics.

ContraFlame® S109 is highly effective in preventing the penetration and destruction of thin enclosure materials. Its versatility extends to safeguarding busbars, mitigating the risk of potential electrical short circuits in lithium-ion battery packs during flame impact, thereby containing thermal runaway events and ensuring controlled flame release.

A notable advantage is the material’s capability to significantly reduce the external surface temperature of the housing. This feature plays a crucial role in controlling the risk of secondary fires or damage. ContraFlame® S109 is particularly effective on aluminium alloys, sheet moulding compound, composites, and thermoplastic substrates.

ContraFlame® S109 is available in widths of 960 mm and 1270 mm and can be obtained with (S109Y) or without (S109N) adhesive backing. Its compatibility with various adhesive technologies allows for tailored applications based on specific needs.

Product characteristics

In service performance:

- 100% mica free
- Flexible and resistant to vibration
- High continuous in-service temperature range from -40 °C up to 150 °C
- No phase change in the operating temperature range
- Highly electrically insulative.

Thermal runaway event performance:

- Tested and proven with various battery cells up to 93 Ah capacity
- Can be used with cylindrical or prismatic cells
- Protects against one off temperatures of over 1200 °C
- Resistant to flame erosion and high velocity hot particles.

Typical applications

- Protection against extreme one-off events such as lithium-ion battery thermal runaway
- Protection of busbar parts against particles and fires
- Internal surfaces of battery pack casings to prevent escape of flame jets
- Lining partitions and dividers to enhance resistance to flame and delay propagation
- Protection of vulnerable components such as coolant hoses, busbars and cables.

Storage

TBD

Performance and properties

Property	Standard	System value	Units
Operating temperature		-40 to 150	°C
Thickness		0.9	mm
Weight		1150	gsm
Nominal density	ISO 1183-1:2019 Part 1, Method A	1250	kg/m^3
Thermal conductivity		0.18	W/(m K)
Dielectric strength	ASTM D149	14.5	kV/mm
Flammability	UL 94	V0	Pass
Flame erosion*	UL 2596 V1	Pass	0.9 mm, 1.2 mm, and 1.5 mm aluminium
Real battery breakthrough testing:			
Prismatic NCM 811 – 86 Ah**	Internal	Pass	0.9 mm aluminium
Prismatic NCM 811 – 93 Ah**	Internal	Pass	0.9 mm aluminium
Prismatic NCM 811 – 2 x 64 Ah**	Internal	Pass	0.9 mm aluminium

* Burning 10 minutes at 900 °C.

** Internal tests for indicating thermal runaway performance, please contact Advanced Innergy Solutions Ltd. for more details.

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