

OUTLAST® LATENT HEAT SYSTEMS™ (LHS) – BATTERY THERMAL MANAGEMENT MATRIX



INFORMATION SHEET | APRIL 2018 | Rev: 3

Outlast® Latent Heat System (LHS™) thermal management materials provide energy absorption and heat dissipation characteristics for passive thermal control. These materials are designed to prevent thermal runaway, maintain homogenous temperatures across cells and reduce battery overheating due to fast charging/discharging which leads to less battery degradation and an increased battery life.

BENEFITS

- Eliminates Thermal Runaway
- Passive Thermal Management
- Improved Battery Life
- Significant Reduction in Thermal Degradation
- Electrically Insulative, not Conductive
- Superior Thermal Mitigation during High Charge/Discharge Cycle
- Homogeneous Cell Temperatures Across Battery Pack



Outlast® LHS Battery Matrix 29-94-4NGP – Typical Properties

Outlast® LHS Battery Matrix is a white composite supplied as either a finished molded/machined part or molded block ready for machining. The matrix produces parts for applications requiring good thermal absorption, temperature homogeneity, low shrinkage and low CTE. The LHS composite meets UL94-Vo rating and RoHS compliance.

Density:	1.27 g/cm ³
Hardness, Shore D:	60D @ 25°C/45A @ 70°C
Specific Heat:	2.1 J/g°C
Phase Transition Temp.:	56-58°C
Heat of Fusion:	100-105 J/g

Outlast® LHS Battery Matrix 29-94-4NGP – Typical Properties (continued)

Thermal Conductivity: <0.4 W/mK

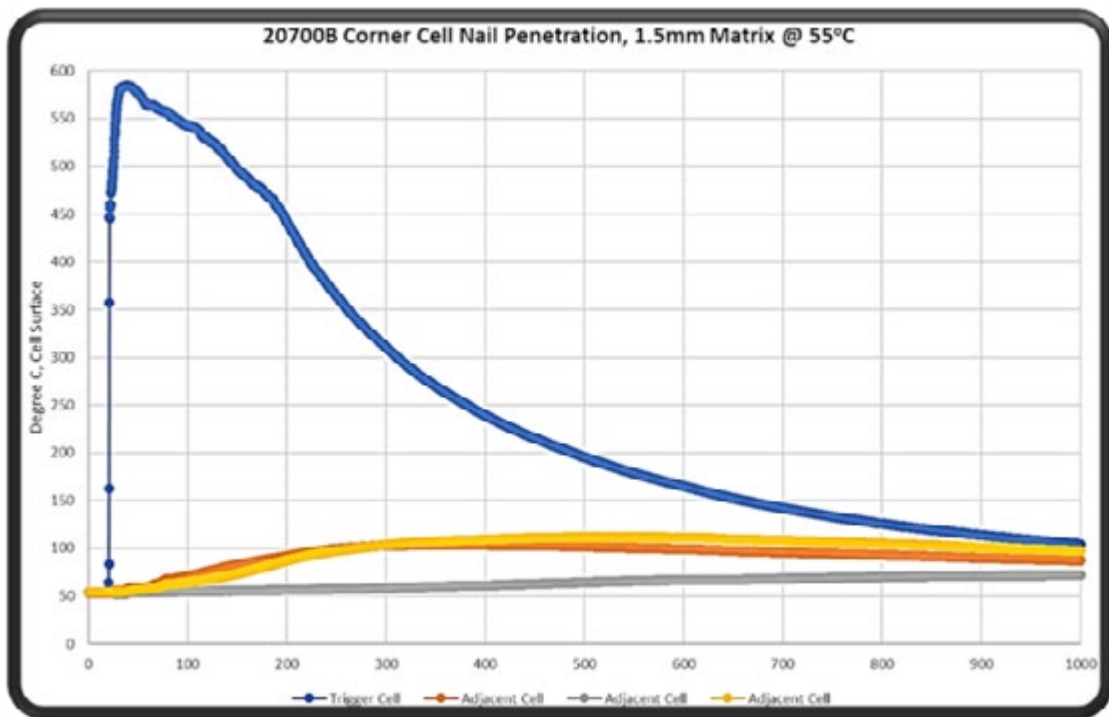
Electrical Bulk Resistivity: $6 \times 10^{11} \Omega \text{ cm}$

Flame Resistance: UL94-V0

RoHs Compliance: COMPLIANT

THERMAL RUNAWAY PROTECTION

Eliminates adjacent battery ignition from short circuited burning cell.

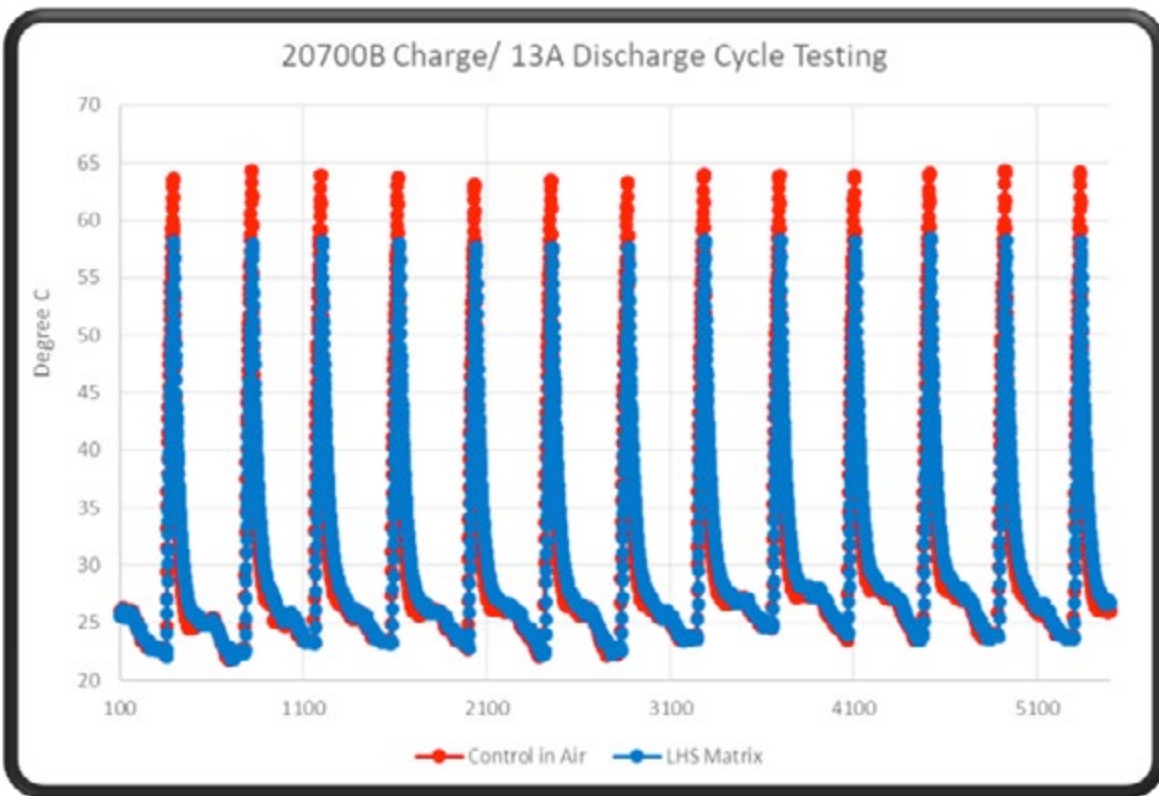


No Adjacent Cell Thermal Propagation



CELL SURFACE TEMPERATURE PROFILE

LHS Matrix yields lower and homogenous cell temperatures across the battery packs.



PRODUCT DETAILS

SUPPLIER: Outlast Technologies LLC

PRODUCT: LHS thermal management composite

END-USE: Thermal management for Li-ion battery packs

STORAGE: Store in a cool, dry place.

HANDLING PRECAUTIONS: Even though this product is considered safe and nontoxic, product safety information for safe use is not included, please refer to MSDS or inquire with qualified technical person at Outlast Technologies LLC.

LIMITATIONS: This product is not intended for pharmaceutical or in-vitro medical use.

Note: Outlast® thermal management materials are developmental products that are furnished for R&D purposes only. The information contained herein is merely preliminary data due to continued development. Further information, including data changes, may occur as testing, process optimization, and formulation changes occur and development proceeds. The user/purchaser agrees that: use is undertaken at the users sole risk, that the material is furnished "asis, with all faults", without any warranty or guarantee; and that Outlast Technologies LLC, Outlast Europe, or Outlast Asia shall not be liable for any damages, of whatever nature, arising out of the user's / purchaser's receipt and/or use of this material. Commercialization and continued supply are not assured.

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