



EST™ Block

Product Data Sheet

Product Description

The EST Block has been specifically designed to manage heat during a battery thermal event via three separate mechanisms:

1. Thermal Energy Absorption: Energy absorption to reduce the amount of thermal energy.
2. Hot Gas Evacuation: Decomposition products continue to propel hot gases out of the housing after the event, thereby reducing energy available for heating.
3. Thermal Resistance: Slows the rate of thermal transmission from the event area. This allows time for heat to conduct to entire apparatus, and gives time for heat to be evacuated by decomposition gases (above).

This material can be customized to meet customer needs and allows for ultra-thin spacing between cells.

Benefits

- Multiple mechanisms for addressing a thermal event:
 - Thermal energy absorption
 - Hot gas evacuation
 - Thermal resistance
- Lightweight
- Non-combustible
- Safe to be machined

Applications

- Cell-Cell thermal runaway propagation for energy storage applications

Environmental & Health Safety

Superwool low bio-persistent fibres are exonerated and are not classified as carcinogenic by IARC or under any national regulations on a global basis. They have no requirements for warning labels under GHS (Globally Harmonised System for the classification and labelling of chemicals).

In Europe, Superwool fibres meet the requirements specified under NOTA Q of European Directive 67/548. All Morgan Advanced Materials Superwool low bio-persistent fibre products are therefore exempt from the classification and labelling regulation in Europe.

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		EST Block
Density, kg/m ³ (pcf)		736 (45.9)
Classification Temperature, °C (°F)		1300 (2372)
Nodus of Rupture, N/cm ² (psi)		206 (298.78)
Specific Heat, J/g•k		
	50°C (122°F)	1.15
	150°C (302°F)	1.33
	200°C (392°F)	1.46
	250°C (482°F)	1.4
	300°C (572°F)	1.34
	400°C (752°F)	1.23
	500°C (932°F)	1.12
	600°C (1112°F)	1.13
	700°C (1292°F)	1.13
Thermogravimetric Mass Change, %		
	200°C (392°F)	0.09
	250°C (482°F)	2.58
	400°C (752°F)	21.89
	600°C (1112°F)	25.90
	800°C (1472°F)	26.74
Thermal Energy Absorption		
	DSC Peak temperature, °C (°F)	230 (446)
	DSC Area, J/g	700.2
Chemical Analysis, % weight basis after firing		
	Alumina, Al ₂ O ₃	84
	Silica, SiO ₂	11
	Calcium Oxide, CaO	3
	Magnesium Oxide, MgO	1
	Alkalis, as Na ₂ O	>1
Thermal Conductivity, W/m•K (BTU•in/hr•ft²•°F), ASTM C 177, Descending		
	100°C (212°F)	0.056 (0.388)
	200°C (392°F)	0.077 (0.534)
	300°C (572°F)	0.095 (0.659)
	400°C (752°F)	0.111 (0.770)
	500°C (932°F)	0.124 (0.860)

Whilst the values and application information in this datasheet are typical, they are given for guidance only. The values and the information given are subject to normal manufacturing variation and may be subject to change without notice. Morgan Advanced Materials – Thermal Ceramics makes no guarantees and gives no warranties about the suitability of a product and you should seek advice to confirm the product's suitability for use with Morgan Advanced Materials - Thermal Ceramics.