

3M™ Thermal Barrier 5000 Series

Technical Data Sheet

Note: Customer is responsible for selecting and validating any use of dispensing equipment to apply the 3M product. It's important that the application process variables (e.g. viscosity, temperature, pressure, etc.) do not alter the material properties of the 3M product in a way that is not intended. Application processes and equipment should be verified and validated by Customer to ensure that the safety features of the battery cells and pack are not compromised. For large-scale automation equipment applications, please work with your 3M Application Engineer. 3M is not responsible for Customer's selection and use of dispensing equipment. All information and recommendations in these application guidelines are derived from manual application using a cartridge.

Product Description

3M™ Thermal Barrier 5000 Series is a dispensable, lightweight silicone-based solution that helps protect neighboring cells from the energy given off from a failed cell by creating a fire retardant, electrically and thermally insulating barrier layer. Tack free time at 25°C: 50-100 minutes and open time at 23°C: 45-65 minutes. Shore A hardness of the room temperature cured solution can range from 10-60.

Application

Can be applied to areas above and around cells, and in the battery modules to help provide thermal and electrical barriers to help address thermal runaway propagation. *

*Customer use must consider not blocking or restricting any safety features in the cell or battery pack design

Typical Product Performance Characteristics*	
Density (ASTM D1056)	0.55-0.8g/ml
Thermal Conductivity (ISO22007-2:2015)	~0.14 W/m-K
Thermal Diffusivity (ISO22007-2:2015)	~0.19 mm ² /sec
Volumetric Heat Capacity (ISO22007-2:2015)	~0.68 MJ/m ³ -K
Specific Heat (ISO22007-2:2015)	~1 J/g K
Dielectric Breakdown Voltage (ASTM D149)	>5.5 KV/mm AC
Viscosity at room temperature Brookfield, T93#, 15 rpm (ASTM D2196-20)	Part A: 30-300 Pa.s Part B: 30-300 Pa.s
VOC Content (cured product) (GBT/28112-2011/CES method)	0.5% max
Limited Oxygen Index (LOI) (ISO 4589)	LOI>26%

*All values are approximate unless otherwise stated.

Usage Guidelines

Please see our Application Guidelines for more information.

Cure Inhibition

3M TB5000 is a silicone addition-curing based product. Its curing process can be affected by certain materials and chemicals that can results in varying degrees of cure inhibition ranging from complete non-cure to a gummy or sticky finish. Products with a high moisture content or a high sulphur content are potentially the most damaging, as are organo-tin salts (used in condensation cure silicones). Amines, urethanes and other nitrogen containing materials can also cause cure inhibition. Unsaturated hydrocarbon plasticizers due to vinyl compounds should also be avoided. Some epoxies, amides and related materials can cause cure inhibition. Substrates must be clean, dry and free of contaminants such as plasticizers or oils.

We recommend running preliminary tests to optimize conditions for a particular application. If self-adhesion is not sufficient, surface treatment or a primer may be applied. Please contact your 3M Application Engineering if there is a need to increase the adhesion between the substrate and product.

Shelf Life

Standard shelf life for drums, cartridges and pails of 3M™ Thermal Barrier 5000 Series is 6 months from date of manufacturing when stored between 5°C to 27°C. An expiration and lot date will identify product. Contact your 3M Application Engineer for more information.

Handling: Observe proper handling precautions as outlined in the SDS. Please consult with your 3M Application Engineer for application methods.

Regulatory Information

Please refer to the product label and Safety Data Sheet (SDS) for health and safety information before using. Observe proper handling precautions as outlined in the SDS, which is available on request or at www.3M.com/msds.

The product is published as a material entry and is available for access on www.mdsystem.com. For product IMDS I.D. number, email requests to 3M-IMDSrequest@mmm.com.

Contact Information

The information provided in this technical document is intended as a guide for these products. For more information or help in selecting a 3M product for an application, please contact your 3M technical service representative or call 1-800-328-1684.

Intended Use: These products are intended for use within a high voltage lithium-ion battery pack to help address the heat and potential debris released from the cell that occurs during thermal runaway propagation in automotive, off-highway, industrial and marine battery applications. Since there are many factors that can affect a product's use, the customer remains responsible for determining whether the 3M product is suitable and appropriate for the customer's specific application and system, including customer conducting an appropriate risk assessment and evaluating the 3M product in customer's application and system.

Restricted Use: 3M advises against the use of this 3M product in any application other than the stated intended use(s), since other applications have not been evaluated by 3M and may result in an unsafe or unintended condition.

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