

3M™ Thermally Conductive Acrylic Interface Pad 5510H

Product Description

3M™ Thermally Conductive Acrylic Interface Pad 5510H is designed to provide a preferential heat transfer path between heat generating components, for example integrated circuit (IC) chips or electric vehicles (EV) batteries, and heat spreaders, such as aluminum heat sinks. 3M pad 5510H consists of a highly conformable slightly tacky acrylic elastomeric sheet filled with conductive ceramic particles.

Key Features

- High thermal conductivity
- Good softness and conformability even to non-flat IC surfaces and automotive batteries
- Good flame retardant, UL 94 V-0 equivalent material
- No siloxane gas / oil bleeding, which often causes electric connection failure
- Soft compliant material allows for pressure relaxation, preventing high pressure zones on components
- Good electrical insulation properties
- Slight tack allows pre-assembly
- Good wettability for better thermal conductivity

Product Construction/Material Description

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

3M™ Thermally Conductive Acrylic Interface Pad 5510H	
Property	Value
Color	White with light gray dots
Base resin	Acrylic
Pad thickness (mm)	1.0, 1.5 (other thickness available upon request)
Primary filler type	Ceramic
Product liner	PET film

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PET liner
Thermally conductive firm layer (less tack)
Thermally conductive conformable layer
PET liner

Applications

- Heat transfer in consumer electronics and automotive electronic products
- Decrease in compression stress to electronic parts by thermal pad softness

Examples:

- Heat transfer between PCB and heat sink
- Thermal management in automotive batteries
- Power electronics component thermal management
- Chip on film (COF) heat conduction
- LED board thermal interface material (TIM)

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- HDTV IC chip
- General gap filling in electronic devices

Application Techniques

Note: Be sure to follow manufacturer’s safety precautions and directions for use when using solvents.

Substrate surfaces should be clean and dry prior to the thermal pad application to ensure best thermal performance. A clean surface can improve the thermal performance of an application.

- Isopropyl alcohol (isopropanol) applied with a lint-free wipe or swab should be adequate for removing surface contamination, such as dust or fingerprints. Do not use “denatured alcohol” or glass cleaners, which often contain oily components. Allow the surface to dry for several minutes before applying the thermal pad. More aggressive solvents (such as acetone, methyl ethyl ketone (MEK) or toluene) may be required to remove heavier contamination (grease, machine oils, solder flux, etc.) but should be followed by a final isopropanol wipe as described above.
- Apply the thermal pad to one substrate at a modest angle with the use of a squeegee, rubber roller or finger pressure to help reduce the potential for air entrapment under the thermal pad during its application.
- Remove the release liner before application.
- Assemble the final part carefully to minimize air entrapment. Applying compression to the substrates is recommended to ensure good wetting of the substrate surfaces with the thermal pads. It is more difficult to assemble two rigid substrates without some air entrapment, as most rigid substrates are not flat and it may be difficult to laminate such substrates together at an angle. Assembly of a flexible substrate to another substrate (rigid or flexible) generally leads to less air entrapment during final part assembly, particularly if applied at a modest angle with the use of a squeegee, rubber roller or finger pressure as described above.

Typical Physical Properties and Performance Characteristics

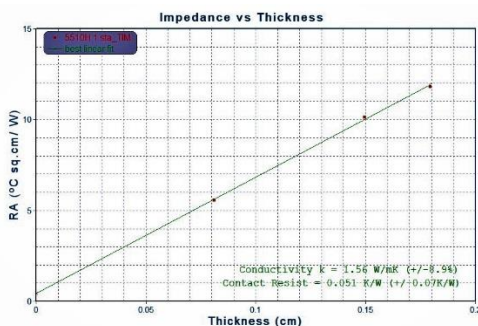
Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes. Final product specifications and testing methods will be outlined in the products Certificate of Analysis (COA) that is provided once the product is approved by 3M for general commercialization and development work is completed.

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Property	Method	Typical Value
Thermal conductivity (W/m-K)	3M test method* ¹	2.0
Thermal conductivity (W/m-K)	ASTM D5470	1.6
Hardness (Shore 00)	ASTM D2240	50
Flammability	UL94	V-0
Dielectric Strength (kV/mm)	ASTM D149	19
Volume Resistivity (Ω-cm)	ASTM D149	4.9 x 10 ¹²
Operating Temperature Range* ²	3M test method	110-130°C

*Note: Tolerances of 1 mm and 1.5 mm = +/-10%, 0.5 mm +/- 0.1 mm.

*¹ Contact 3M Technical Service for test method

*² 3M CPSAs should be tested in the desired application to ensure the product is appropriate for use based on the application’s specific requirements, including substrate types, contact grounding area, surface geometry in the bond line, flexibility of substrates, bonding conditions, applied voltage/current, application environment and environmental aging conditions/exposure.



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Heat Resistance

3M™ Thermally Conductive Acrylic Interface Pad 5510H has high temp 130°C durability. Sample which is aged for 2,000 hours at 130°C ambient temp shows no significant change for thermal conductivity and hardness.

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Storage and Shelf Life

Product shelf life is 12 months from date of manufacture when stored in the original packaging materials and stored between 15°C and 30°C and between 20% and 70% relative humidity. An attribute of the product that can vary with storage time is liner release force and yellowing. Yellowing should be allowable. With storage time, liner release can increase and the increase could impact the products converting or ease of end use liner removal.

Certificate of Analysis (COA)

The 3M Certificate of Analysis (COA) for this product is established when the product is commercially available from 3M. The commercially available product will have a COA specification established. The COA contains the 3M specifications and test methods for the products performance limits that the product will be supplied against. The 3M product is supplied to 3M COA test specifications and the COA test methods. Contact your local 3M representative for this product's COA.

This technical data sheet may contain preliminary data and may not match the COA specification limits and/or test methods that may be used for COA purposes.

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Final product specifications and testing methods will be outlined in the products Certificate of Analysis (COA) that is shipped with the commercialized product.

Regulatory: For regulatory information about this product, contact your 3M representative.

Technical Information: The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

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