

3M™ Thermally Conductive Silicone Interface Pads 5591 and 5591S

Product Description

3M™ Thermally Conductive Silicone Interface Pad 5591 and 5591S are highly conformable, slightly tacky silicone elastomer pads. These interface pads are designed to provide heat transfer path between heat generating components and heat sinks, heat spreaders or other cooling devices.

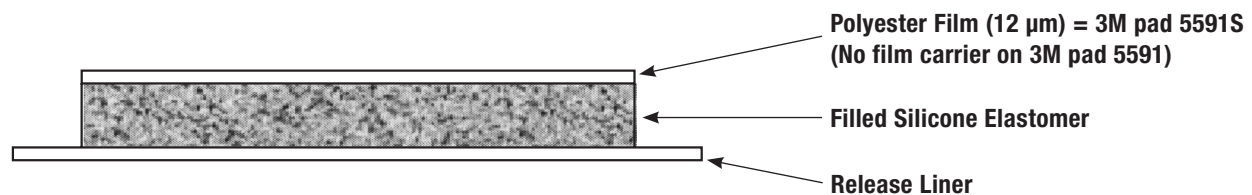
Features and Benefits

- Good thermal stability of the base polymer with excellent softness of the thermal pad.
- Good thermal conductivity in an ultra soft silicone polymer base.
- The product tack is such that a mechanical means to support the pad in a final assembly is required.

Product Construction

3M™ Thermally Conductive Silicone Interface Pad 5591 and 5591S	
Color	White
Pad Type	Filled Silicone Polymer
Pad Thickness*	0.5 mm, 1.0 mm, 1.5 mm, 2.0 mm
Primary Filler Type	Ceramic
Top Liner / 5591S Film Type (film stays with pad)	3M pad 5591S – 12 µm PET Film
Release Liner Thickness / Type	Base Liner 4 mils (100 µm) Transparent PET / Optionally, 60 µm Embossed PE film with transparent blue color is available.

*Note: 3M pad 5591 not available in 0.5 mm thickness.
Optional thickness > 2.0 mm are available. Contact your 3M representative for more information.



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.

Property	Value	Method
Product Number¹	3M™ Thermally Conductive Silicone Interface Pads 5591 and 5591S	
Thermal Conductivity (W/m-K)	1.0 W/m-K	3M Test Method with low pressure (<10 psi)
Operating Temperature Range²	-60°C to 130/140°C Long Term (Weeks-Months) -60°C to 160/180°C Short Term (Hours-Days)	3M Test Method
Hardness Shore 00³	Shore 00 results depend on test method and thickness of the sample tested. Typical results are in the 10-15 Shore 00 range @ 6 mm test thickness without the PET film. Ask 3M for more details on pad softness.	Modified ASTM D2240
Dielectric Breakdown	200 V/mil AC (3M pad 5591S tested)	3M TM (ASTM D149)
Volume Resistivity	2 x 10 ¹² Ohms (3M pad 5591S tested)	ASTM D257
Flammability Rating	3M pad 5591 has not been tested for UL 3M pad 5591S tested: UL 94 V-1 (0.5mm) and UL 94 V-1 (1.0mm - 5.0mm)	N/A UL-94

Notes:

¹ 3M pad 5591S has a 12 micrometer PET Film added to provide for a non-tacky surface, increased puncture resistance, and ease of handling and rework.

² Potential Operating Temperature Range (°C). End use application testing will determine final temperature range based on final design and other environmental conditions. Suggested temperature range is based on a 3M Test Method.

³ 3M pad 5591S tested with-out PET film on product.

Application Guidelines

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

- 1) 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.

Note: Be sure to read and follow the manufacturers’ precautions and directions when using solvents.

- 2) 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.
- 3) Assemble the part by applying compression to the substrates to help ensure a good wetting of the substrate surfaces with the thermal pads. Rigid substrates are more difficult to assemble without air entrapment as most rigid parts are not flat. Flexible substrates can be assembled to rigid or flexible parts with much less concern about air entrapment because one of the flexible substrate can conform to the other substrates during application.

Storage and Shelf Life

The shelf life of 3M™ Thermally Conductive Interface Silicone Pad 5591 and 55921 is 12 months from the manufacture date when stored in original packaging at 21°C (70°F) and 50% relative humidity.

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.

Product Use

Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

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