



3M™ Thermally Conductive Adhesive Tape 8940

Product Information Sheet

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Product Description 3M™ Thermally Conductive Adhesive Tapes 8940 is designed to provide an efficient heat transfer path between heat generating components and heat sinks or other cooling devices.

The tape (3M™ 8940) consists of a carrier, highly loaded with thermally conductive fillers, coated on both sides with a high temperature resistance acrylic pressure sensitive adhesive.

The specialized construction securely bonds the heat generating components to heat sinks and offers thermal conduction. The tape is electrically insulating.

Product Construction

	3M 8940
Color	Beige
Carrier	Filled Copolymer
Adhesive type	Modified Acrylic Adhesive
Tape type	Double sided adhesion
Tape Thickness	0.19 mm
Liner Thickness	0.075 mm

Typical Applications Applications requiring thin bonding with good thermal transfer. The tape performance properties have been primarily adapted to meet the demanding criteria for use in Automotive Electronic Thermal Management. Typical applications are: Engine Control Units, ABS Systems, Gear Control Units.

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Typical Properties and Performance Characteristics

Note: The following technical information for 3M™ Thermally Conductive Tape 8940 should be considered representative or typical only and should not be used for specification purposes.

Thermal Properties

Test	Unit	Value	Test Method
Thermal Conductivity at 25 °C	W/m*K	0.4	Modified ASTM D 5470
Coefficient of Thermal Expansion (-40 to +150°C)	mm/°C	140 x 10 ⁶	3M
Thermal Impedance	°C•in ² /W	0.78	3M
	°C•cm ² /W	5.1	3M

Electrical Properties

Test	Unit	Value	Test Method
Breakdown Voltage ^{*1}	kV	9.5	IEC 60243-1
Dielectric Strength ^{*2}	kV/mm	52.8	IEC 60243-1
Volume Resistivity	Ω•cm	2.5 x 10 ¹³	ASTM D257

^{*1} Average value (not for specification purposes). Standard deviation of 1.6 kV has been observed.

^{*2} Average value (not for specification purposes). Standard deviation of 10 kV/mm has been observed.

Mechanical Properties

90° Peel Adhesion to Aluminium Substrate
(AlMg₃; R_a: 0.48 μm; R_z: 2.4 μm)

Test	Unit	Value	Test Method
20 min dwell time at room temp.	N/cm	5.0	AFERA 4001
24 h dwell time room temp.	N/cm	6.0	AFERA 4001
at 150 °C	N/cm	4.9	AFERA 4001
at 180 °C	N/cm	2.4	AFERA 4001

Lap Shear

20 min dwell time at room temp.	MPa	5.3	ASTM D 1002
24 h dwell time room temp.	MPa	9.0	ASTM D 1002
After 24 h @ 150 °C	MPa	6.8	ASTM D 1002
After 24 h @ - 40 °C	MPa	9.0	ASTM D 1002
1000 g load @ room temp.	Minutes	10000+	AFERA 4012
500 g load @ 70 °C	Minutes	10000+	AFERA 4012

Holding Power

Tensile Strength

Tensile Strength	N/mm ²	6-7	EN ISO 527-2
Elongation at break	%	80-120	EN ISO 527-2

Liner properties Temperature Performance

Liner release	cN/25.4 mm	15	FINAT TM3
Thermal Stability 225 °C Dwell @ 60 min (Tape was applied between a glass and an aluminium panel)	Visual	No Change	3M
Operating Temperature Range	°C	- 40 up to +150	3M

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Thermal Resistance Properties

Test	Unit	Value	Test Method
Thermal Gravimetric Analysis *			
Mass loss at 200 °C	%	< 0.2	3M
Mass loss at 150 °C after 4 h	%	< 0.3	

* Average value (not for specification purposes).

Flammability Class:

UL 94 V-0, File E253171, Flame rating applies to adhesive film (3M™ Thermally conductive Tape 8940) bonded to 3.0 mm minimum thickness aluminium on one side and 0.86 mm minimum thickness FR-4 laminate on other side.

Application Guidelines

1.) Substrate surfaces should be clean and dry prior to tape application. Isopropyl alcohol (isopropanol) applied with a lint-free wipe or swab should be adequate for removing surface contamination such as dust or finger prints. Do not use “denatured alcohol” or glass cleaners which often contain oily components. Allow the surface to dry for several minutes before applying the tape. 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 primers and solvents.

2) Apply the tape to one substrate at a modest angle with the use of a squeegee, rubber roller pressure to help reduce the potential for air entrapment under the tape during its application. The liner can be removed after positioning the tape onto the first substrate.

3) Assemble the part by applying compression to the substrates to ensure a good wetting of the substrate surfaces with the tape. Proper application of pressure (amount of pressure, time applied, temperature applied) will depend upon design of the parts. The preferred pressure at room temperature is a minimum of 1 kg/cm² for 5 seconds. For fragile parts lower pressure may be needed.

Rigid substrates are more difficult to bond without air entrapment as most rigid parts are not flat. Flexible substrates can be bonded to rigid or flexible parts with much less concern about air entrapment because one of the flexible substrates can conform to the other substrate.

Shelf Life

Product shelf life is 2 years from date of manufacture when stored at room temperature conditions 22°C and 50% r. H. in the products original packaging.

Certification/ Recognition

MSDS: Despite of the fact that there is no obligation to write an MSDS according to the MSDS requirements of the Occupational Safety and Health Administration's Hazard Communication Standard, 29 C.F.R. 1910.1200(b)(6)(v), 3M has prepared a MSDS. When properly handled in accordance with the 3M instructions for use, these products should not present a health and safety hazard. However, improper handling of the products may affect their performance and cause health and safety risks.

TSCA: These products are defined as articles under the Toxic Substances Control Act and therefore, are exempted from inventory listing requirements.

RoHS: These products comply with the requirements of EU Directive 2002/95/EC and 2005/618/EC.

Important Notice

All statements, technical information and recommendations herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of application. Please remember that many factors can affect the use and performance of a 3M product in a particular application. The materials to be bonded with the product, the surface preparation of those materials, the product selected for use, the conditions in which the product is used, and the time and environmental conditions in which the product is expected to perform are among the many factors that can affect the use and performance of a 3M product. Given the variety of factors that can affect the use and performance of a 3M product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method of application. All questions of liability relating to the 3M product are governed by the Terms of Sale of the selling 3M entity subject, where applicable, to the prevailing law.



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