



PRODUCT DESCRIPTION

Laird Tflex HD300 is a 2.7 W/mK gap filling material in our high deflection line of products. Tflex HD300 is an excellent choice when wide manufacturing tolerances occur. These variable gaps can be filled with Tflex HD300 while generating minimal board and component stress. Laird's unique manufacturing capabilities, filler and resin knowledge result in this unique product designed with customer applications in mind.

Tflex HD300 is provided in thickness from .5mm (.020") up to 5mm (.200") in .5mm (.020") increments as standard. Non-standard increments of .25mm (.010") are available if required, please contact Laird for information and pricing. In addition, Laird can provide Tflex HD300 in multiple converted formats through approved converters and distribution networks. Also, if your application requires, we can deliver sheets of material as large as 460mm (18") X 460mm (18").

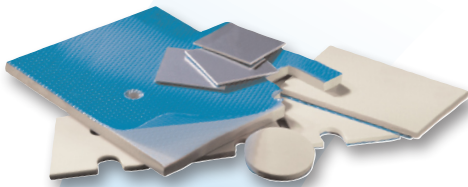
FEATURES AND BENEFITS

- 2.7 W/mK thermal conductivity
- Low pressure versus deflection characteristics
- Excellent surface wetting for low contact resistance
- Minimizes board and component stress
- Large tolerance applications
- Converted parts and sheets available
- .5mm (.020") to 5mm (.200) standard
- Naturally tacky on both sides, or available with Laird's DC1 option for tack on one side only.
- .5mm (.020") and .75mm (.030) use fiberglass (FG) reinforcement.

SPECIFICATIONS

CATEGORIES	TYPICAL VALUE	METHOD
Construction	Ceramic filled silicone elastomer	
Color	Pink	Visual
Thermal Conductivity	2.7 W/mK	Hot Disk
Hardness (Shore 00; 3 sec)	30	ASTM D2240
Specific Gravity	3.1	Helium Pycnometer
Flammability	VO	UL 94
Temperature Range	-40C to 200C	
Outgassing TML	0.39%	ASTM E595
Outgassing CVCM	0.10%	ASTM E595
Thickness Range	.5mm to 5mm (.020"-.200")	

THR-DS-Tflex HD300_052615



UNIQUE SILICONE GEL OFFERS COMPLIANCY, THERMAL RESISTANCE

Tflex™ 300, at pressures of 50psi, will deflect to over 50% the original thickness. This high rate of compliancy allows the material to “totally blanket” the component, enhancing thermal transfer. The material has a very low compression set enabling the pad to be reused many times.

Tflex™ 300, in achieving its stellar compliancy, does not sacrifice thermal performance. With a thermal conductivity of 1.2 W/mK, low thermal resistances can be achieved at low pressures.

Tflex™ 300-H is offered with a hard, metallized liner option for easy handling and improved rework. The metallized liner's lower coefficient of friction also allows for easy assembly of parts that must slide together, such as a card into a chassis.

Tflex™ 300-TG is offered with a cut-through resistant Tgard™ silicone liner. The TG liner offers a guaranteed dielectric barrier, and easier part handling for mass production.

FEATURES AND BENEFITS

- Extreme compliancy allows material to “totally blanket” component(s)
- Thermal conductivity of 1.2 W/mK
- Available in thicknesses from 0.020” - 0.200” (.5mm – 5.0mm)
- Low compression set enables the pad to be reused many times

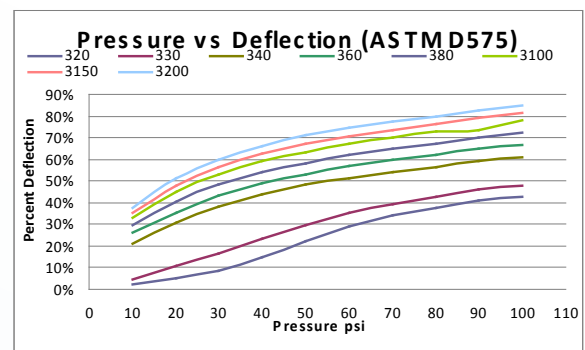
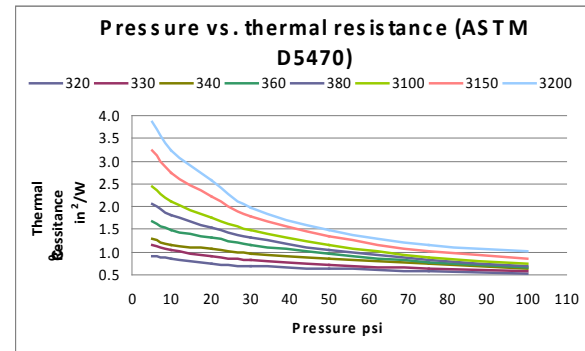
APPLICATIONS

- Notebook and desktop computers
- Telecommunication hardware
- Flat panel displays
- Memory modules
- Power conversion equipment
- Set top box
- Lighting ballast
- Automotive electronics
- LED lighting
- Handheld electronics
- Optical disk drives
- Vibration dampening

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TFLEX™ 300 TYPICAL PROPERTIES

	TFLEX™ 300	TEST METHOD
Construction	Filled silicone elastomer	NA
Color	Light green	Visual
Thermal Conductivity	1.2 W/mK	ASTM D5470
Hardness (Shore 00)	27 (at 3 second delay)	ASTM D2240
Density	1.78 g/cc	Helium Pycnometer
Thickness Range	0.020" - .200" (0.5 - 5.0mm)*	
Thickness Tolerance	±10%	
UL Flammability Rating	94 V0	UL
Temperature Range	-40°C to 160°C	NA
Volume Resistivity	10 ¹³ ohm-cm	ASTEM D257
Outgassing TML	0.56%	ASTM E595
Outgassing CVCM	0.10%	ASTM E595
Coefficient Thermal Expansion (CTE)	600 ppm/C	IPC-TM-650 2.4.24



STANDARD THICKNESSES

0.020 to 0.200-inch (0.5 to 5.0mm)*
 0.020 to 0.200-inch thick material available in 0.010-inch (0.25mm) increments
 0.250-inch (6.4 mm) also available with TG liner option only.
 *Inquire about availability of material and options above 0.200-inches

OPTIONS

Tgard™ "TG" dielectric barrier available to aid in handling and PET dielectric "H" liner available for applications where easy slide assembly is desirable

MATERIAL NAME AND THICKNESS

Tflex™ indicates elastomeric gap filler product line
 3xxx indicates high recovery '3 series' 1.2 W/mK material
 -DC1 designates proprietary tack eliminated coating
 -TG indicates Tgard™ liner option
 -H indicates hard PET liner option

EXAMPLES

Tflex™ 3120 = standard 0.120-inch thick Tflex™ 300 material
 Tflex™ 3120DC1 = 0.120-inch thick material with DC1 coating
 Tflex™ 3120TG = 0.120-inch thick material with Tgard™ liner
 Tflex™ 3120H = 0.120-inch thick material with hard PET liner

THR-DS-TFLEX-300 1010



COMPLIANT POLYIMIDE LINED GAP FILLER

Laird Tflex® P300 is a soft and compliant gap filler with an integrated polyimide liner. Laird has leveraged its vast experience and knowledge in the development of thermally conductive materials to develop a soft and compliant gap filler that minimizes contact resistance and board level stresses. In conjunction with these key traits Laird understands that not all applications are the same. As a result P300 comes with a unique and integrated polyimide film on one side. This liner provides numerous application benefits like electrical isolation, placement ease during assembly, tear resistance for applications that require shear, to name a few. Tflex® P300 will be offered in thicknesses that range from .040" (1mm) up to .200" (5mm).

FEATURES AND BENEFITS

- Compliant nature minimizes contact resistance
- Integrated polyimide film provides dielectric strength
- Resistance to burrs and mechanical forces
- Resistant to shear forces.
- Thermal Conductivity of 3 W/mK
- Contrasting color allows integration with vision system
- Low silicone bleed
- Shore hardness of 30 (Shore 00)

SPECIFICATIONS

CATEGORIES	FEATURES	
Construction		
Color	Purple	Visual
Thermal Conductivity	3.0	Hot Disk
Hardness (Shore 00; 3 sec)	30	ASTM D2240
Specific Gravity	3.10 g/cc	Helium Pycnometer
Flammability	V0	UL 94
Temperature Range	-40C to 125C	
Outgassing TML	0.2%	ASTM E595
Outgassing CVCM	0.05%	ASTM E595
Thickness	1mm – 5mm (.040" - .200")	
Breakdown Voltage	>5kV	ASTM D149

THR-DS-Tflex P300_073015

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UNIQUE SILICONE GEL OFFERS COMPLIANCY, THERMAL RESISTANCE

The high rate of compliancy of Tflex™ 300TG allows the material to “totally blanket” the component, enhancing thermal transfer. The material has a very low compression set enabling the pad to be reused many times. Tflex™ 300TG, in achieving its stellar compliancy, does not sacrifice thermal performance. With a thermal conductivity of 1.2 W/mK, low thermal resistance can be achieved at low pressures.

A Tgard™ silicone liner has been added to the Tflex™ 300TG to offer a guaranteed dielectric barrier. The Tgard™ is cut-through resistant and provides easier part handling in mass production.

FEATURES AND BENEFITS

- Extreme compliancy allows material to “totally blanket” component(s)
- Thermal conductivity of 1.2 W/mK
- Provides a dielectric barrier
- Low compression set enables the pad to be reused many times

APPLICATIONS

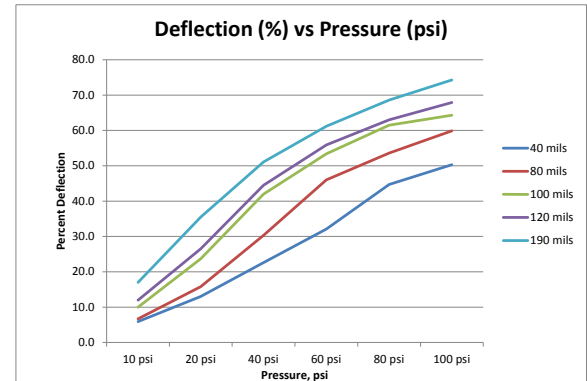
- Notebook and desktop computers
- Telecommunication hardware
- Flat panel displays
- Memory modules
- Power conversion equipment
- Set top box
- Lighting ballast
- Automotive electronics
- LED lighting
- Handheld electronics
- Optical disk drives
- Vibration dampening

Tflex™ 300TG Series

Thermal Gap Filler

Tflex™ 300TG TYPICAL PROPERTIES

	Tflex™ 300TG	TEST METHOD
Construction	Filled silicone elastomer on carrier line	NA
Color	Light green	Visual
Thickness Range	0.020 - .200 in (0.5 - 5.0 mm), 0.250 in (6.4 mm)	
Thickness Tolerance	±10%	
Surface Adhesion	1 side	
Specific Gravity	1.79	ASTM D792
Hardness (Shore 00)	27	ASTM D2240
Thermal Conductivity	1.2 W/mK	ASTM D5470
Thermal Resistance, 10 psi	1.59 °C in ² /W	ASTM D5470 modified
Coefficient of Thermal Expansion (CTE)	600 ppm/C	IPC-TM-650 2.4.24
Operating Temperature Range	-40°C to 160°C	
Breakdown Voltage	>10,000 VAC	ASTM D149
Flammability Rating	94V0	UL
Outgassing, TML	0.56%	ASTM E595
Outgassing, CVCM	0.10%	ASTM E595



STANDARD THICKNESSES

0.020 to 0.200 in (0.5 to 5.0 mm)*

0.020 to 0.200 in thick material available in 0.010 inch (0.25 mm) increments

*0.250 in (6.4 mm) thickness is available

MATERIAL NAME AND THICKNESS

Tflex™ indicates elastomeric gap filler product line

3xxx indicates high recovery '3 series' 1.2 W/mK material

TG indicates Tgard™ liner

EXAMPLES

Tflex™ 3120TG = 0.120 in thick material with Tgard™ liner

THR-DS-TFLEX-300TG 0611

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Performance Thermal Gap Filler



PRODUCT DESCRIPTION

Laird Tflex[™] HD700 is our latest product in our High Deflection series. Tflex[™] HD700 combines a 5 W/mK with superior pressure versus deflection characteristics. The combination will allow minimal stress on components while also yielding low thermal resistance. The result will be higher mean time before failure (MTBF) of your device as less mechanical and thermal stresses will be experienced.

Tflex[™] HD700 is available in thickness from 0.5mm (0.020") to 5mm (0.200"). Laird can provide material to meet your production needs in any region through our local production facilities. Please contact your local Laird sales or field engineering contact for samples or questions.

FEATURES AND BENEFITS

- 5.0 W/mK thermal conductivity
- Low pressure versus deflection
- Excellent surface wetting for low contact resistance
- Minimizes board and component stress
- Large tolerance applications
- Converted parts and sheets available
- .5mm (.020") to 5mm (.200") standard

TYPICAL PROPERTIES

PROPERTY	TYPICAL VALUE	TEST METHOD
Construction	Ceramic filled silicone gap filler	
Color	Pink	Visual
Thermal Conductivity	5.0 W/mK	Hot Disk
Hardness (3 sec)	55 Shore 00 (1-5mm) 66 Shore 00 (0.5-0.75mm)	ASTM D2240
Specific Gravity	3.3	Helium Pycnometer
Flammability	VO - Pending	UL 94
Continuous Use Range	-50 to 200°C	Pending
Outgassing TML	TBD	ASTM E595
Outgassing CVCM	TBD	ASTM E595
Thickness Range	.5mm to 5mm (.020"-.200")	

THR-DS-Tflex HD700_062816



PRODUCT DESCRIPTION

Laird Tflex[®] P100 is a soft and compliant gap filler with an integrated Tgard liner and adds a complementing performance level to the P series product line from Laird. Laird has leveraged its vast experience and knowledge in the development of thermally conductive materials to develop a soft and compliant gap filler that minimizes contact resistance and board level stresses. In conjunction with these key traits Laird understands that not all applications are the same. As a result P100 comes with a unique and Tgard liner on one side. This liner provides numerous application benefits like electrical isolation, placement ease during assembly, tear resistance for applications that require shear, to name a few. Tflex[®] P100 will be offered in thicknesses that range from .5mm (.020") up to 5mm (.200").

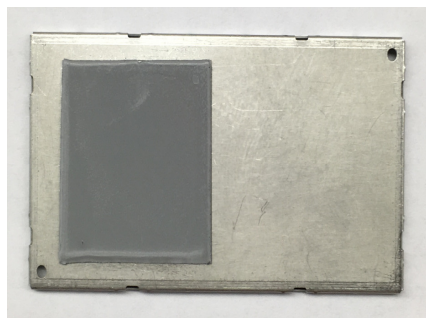
FEATURES AND BENEFITS

- Compliant nature minimizes contact resistance
- Integrated Tgard liner provides dielectric strength
- Resistance to burrs and mechanical forces
- Resistant to shear forces.
- Thermal Conductivity of 1.2 W/mK
- Contrasting color allows integration with vision system
- Shore hardness of 13 (Shore 00)

TYPICAL PROPERTIES

PROPERTY	TYPICAL VALUES	TEST METHOD
Construction	Tgard Lined Elastomer	
Color	Yellow	Visual
Thermal Conductivity	1.2 W/mK	Hot Disk
Hardness (Shore 00; 3 sec)	13	ASTM D2240
Specific Gravity	2.3	Helium Pycnometer
Flammability	V0	UL 94
Temperature Range	-40C to 180C	
Outgassing TML	0.32%	ASTM E595
Outgassing CVCMM	0.05%	ASTM E595
Thickness	.5mm – 5mm (.020" - .200")	
Breakdown Voltage	>5kV	ASTM D149

THR-DS-Tflex P100_040716



HIGH THERMAL CONDUCTIVITY, SILICONE FREE, THIN GAP FILLER

Slim TIM[™] 10000 is a non-silicone, high performance thermal interface material designed for thin gap applications. It takes advantage of a novel, new chemistry enabling free standing, high thermal conductivity, thin gap fillers. Slim TIM 10000 is currently available in 0.125, 0.200, and 0.250 mm thicknesses, soon to be available at 0.075 and 0.500 mm.

Slim TIM 10000 utilizes a unique polymer chosen to maximize system performance. The specially designed polymer package:

- Enables free standing, thin films (no carrier film, e.g., PI, fiberglass)
- Minimizes contact thermal resistance while offering high thermal conductivity
- Is silicone free
- Survives multiple solder reflow operations (Pb-free solder reflow profiles)
- Allows easy rework, requiring minimal force to separate components
- Enables pre-application / pre-assembly to heat sinks, BLS or other substrates

FEATURES AND BENEFITS

- Free standing film
- High thermal performance
- Exceptionally low thermal resistance
- Silicone-free
- Solder reflow compatible (3X)
- High reliability
- Easy rework
- Naturally tacky (no PSA needed)

MARKETS / APPLICATIONS

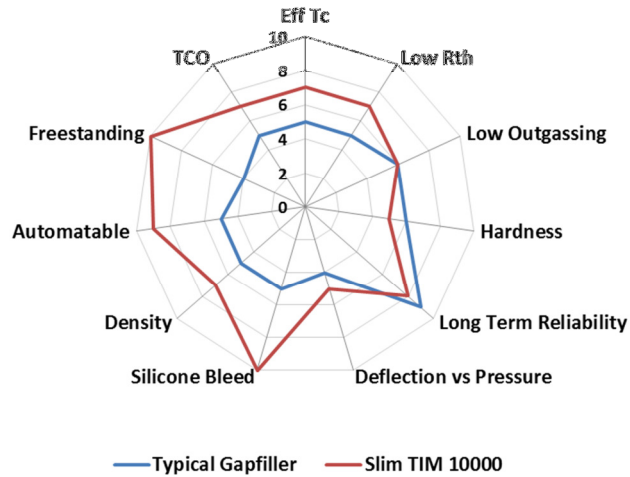
- Handsets
- Tablets
- Notebooks
- Wearables
- Flat Panel Displays
- Hard Disk Drives
- Optical Components
- Graphics Cards
- Memory Module

TYPICAL PROPERTIES	Slim TIM 10000	TEST METHOD
Construction	Free Standing Film	
Color	Grey	Visual
Specific Gravity (g/cc)	2.52	Helium Pycnometer
Thermal Conductivity (W/mK)	5.5	Hot disk
Thermal Resistance (cm²°C/W)		
0.125 mm	0.452	ASTM D5470
0.200 mm	0.516	50°C, 5% deflection
0.250 mm	0.645	
Max Continuous Use Temp (°C)	125	
Solder Reflow Profile	Min 3x	J-STD-020D
Hardness (Shore 00)	80 for 3 seconds, 72 for 30 seconds	ASTM D2240
UL Flammability Rating (UL 94)	V0 (in progress)	UL94

THR-DS-Slim TIM, Preliminary 032117

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VALUE PROPOSITION (Gap Fillers < 250 microns)



APPLICATION METHOD

Lab Evaluation Method:

- Cut sample to desired shape
- Remove one liner from the material
- Place the material facing down onto the heat sink
- Start at one edge and force the air out from under the pad by rubbing with moderate finger pressure
- Remove the second liner by peeling from a corner by hand/tools
- Alternatively, apply tape to one corner of the pad at a 45 degree angle and lift the tape straight up quickly to remove the second liner
- Refer to “Slim TIM & IceKap Application Method – Tape & Peel” or “Slim TIM Directions for Use”

Production Volume Manufacturing:

- Slim TIM is designed for use with the TIM Print Application process
- Refer to “TIM Print Application Guide”

PRODUCT STORAGE CONDITIONS

- Store in original packaging or a light-proof package
- Store at 0-35°C and maximum 50% RH

SHELF LIFE

- 1 year from date of shipment when stored at above conditions

THR-DS-Slim TIM, Preliminary 032117