

# THERM-A-GAP 174, 274 and 574

## Thermally Conductive Pads



### OVERVIEW

THERM-A-GAP™ 174, 274, and 574 represent the original gap-fillers from Chomerics. These materials have gained broad acceptance across multiple applications from everyday consumer products to the most rigorous applications in military and aerospace electronics. These products are available with aluminium foil "A" or on "clean break" glass fibre "G". As with all previous Chomerics gap-fillers,

the "A" versions come with a high strength pressure sensitive acrylic adhesive for permanent attachment to the cold surfaces. The clean break "G" versions have no adhesive, but are inherently tacky. In addition, 174 and 274 are available with "T" backing, which is composed of a rigid, acrylic PSA-backed thermal insulation pad. This option provides a 0.25 mm (0.010 in) thick, tear and puncture resistant dielectric layer.

### THERM-A-GAP™ Thermally Conductive Pads

		174	274	574	
Physical	Colour	Light Purple	Green	Light Gray	Visual
	Carrier G= Woven Glass with no PSA A= Aluminium foil with PSA T= Thermal Base Stock with PSA	G,A,T	G,A,T	G,A	Visual
	Standard Thickness* mm (inch)	0.50 - 5.0 (0.020 - 0.200)	0.50 - 5.0 (0.020 - 0.200)	1.02 - 5.0 0.020 - 0.200	ASTM D374
	Specific Gravity	2.3	2.1	1.7	ASTM D792
	Hardness, Shore 00	55	60	20	ASTM D2240
	Hardness, Shore A	10	15	< 5	ASTM D2240
	Silicone Extractable, %	7.5	6 - 7	16 - 17	Chomerics
	Percent Deflection @ Various Pressures, % @ 34 kPa (5 psi) @ 69 kPa (10 psi) @ 172 kPa (25 psi) @ 345 kPa (50 psi)	% Deflected 17 21 28 35	% Deflected 14 17 23 30	% Deflected 25 32 45 58	ASTM C165 MOD (0.125 in "A" Type, 0.50 in diameter, 0.025 in/min rate)
	Operating Temperature Range °C [°F]	-55 to 200 [-67 to 392]	-55 to 200 [-67 to 392]	-55 to 200 [-67 to 392]	--
Thermal	Thermal Impedance @ 0.040" on "G", °C-cm²/W [°C-in²/W] @ 10 psi	9.7 (1.5)	11.6 (1.8)	9.7 (1.5)	ASTM D5470
	Thermal Conductivity @ 0.040" on "G", W/mK	1.1	0.9	1.2	ASTM D5470
	Heat Capacity, J/g-K	1	1	1	ASTM E1269
	Coefficient of Thermal Expansion, ppm/K	250	300	300	ASTM E1269
Electrical	Dielectric Strength, KVac/mm (Vac/mil)	8 (200)	8 (200)	8 (200)	ASTM D149
	Volume Resistivity, ohm-cm	10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>14</sup>	ASTM D257
	Dielectric Constant @ 1.000kHz	6.4	5.5	4.0	ASTM D150
	Dissipation Factor @ 1,000kHz	0.010	0.010	0.001	Chomerics
Regulatory	Flammability Rating (See UL File E140244 for Details)	V-0	V-0	V-0	UL 94
	RoHs Compliant	Yes	Yes	Yes	Chomerics Certification
	Outgassing, %TML [%CVM]	0.50 [0.20]	0.48 [0.17]	0.83 [0.26]	ASTM E595
	Shelf Life, months from date of shipment A [G] [T]	18 [24] [6]	18 [24] [6]	18 [24] [6]	Chomerics

\*Thickness tolerance, mm(in.) ±10% nominal thickness @ 2.5mm (100 mil) or less;

± 0.25mm (10mil) @ nominal thickness greater than 2.5mm (100 mil). Custom thicknesses may be available upon request.

# THERM-A-GAP™ 174, 274 and 574 Thermally Conductive Pads

## FEATURES / BENEFITS

Broad range of hardnesses available  
Moldability for complex parts Good thermal performance  
High tack surface reduces contact resistance  
"T" version offers electrically insulating reinforcement with acrylic PSA  
"A" version offers high strength PSA for permanent attachment  
UL recognized V-0 flammability rating RoHS compliant  
Pass NASA outgassing (ASTM E595)

## TYPICAL APPLICATIONS

Desktop computers, laptops, servers  
Telecommunications equipment  
Consumer electronics  
Automotive electronics  
Motor and engine controllers  
Cellular handsets  
Power conversion

Memory modules  
Heatpipe assemblies  
Dual thermal / vibration dampening  
Voltage regulators

## PRODUCT ATTRIBUTES

**174**  
Good thermal performance  
Good conformability  
Available with "T" dielectric backer

**274**  
Good thermal performance  
Moderate conformability  
Available in ribbed configuration to reduce compressive forces  
Available with "T" dielectric backer

## 574

Good thermal performance  
Very low deflection force for low stress, high heat load applications  
Most compliant

## HANDLING INFORMATION

These products are defined by Chomerics as "articles" according to the following generally recognized regulatory definition for articles:

An article is a manufactured item "formed to a specific shape or design during manufacturing," which has end use functions" dependent upon its size and shape during end use and which has generally "no change of chemical composition during its end use." In addition, there is no known or anticipated exposure to hazardous materials/substances during routine and anticipated use of the article. These materials are not deemed by Chomerics to require an MSDS.

## Ordering Information

Thermally conductive pads are available in the following formats.

### Distributor sheets with psa - 18" X 18"

0.020"= 69-12-20698-ZZZZ = 0.5mm  
0.040"= 69-12-20684-ZZZZ = 1.02mm  
0.070"= 69-12-20685-ZZZZ = 1.78mm  
0.100"= 69-12-20672-ZZZZ = 2.54mm  
0.130"= 69-12-20675-ZZZZ = 3.0mm  
0.160"= 69-12-20686-ZZZZ = 4.0mm  
0.200"= 69-12-20687-ZZZZ = 5.08mm

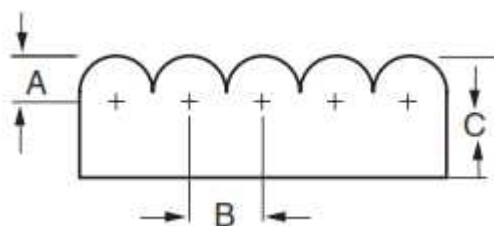
### Ribbed Sheet 9" x 9" (274 No PSA)

62-04-23111-A274 .040" RIB .031 1.02mm  
62-04-23111-T274 .040" RIB .031 1.02mm  
62-07-23112-A274 .070" RIB .031 1.78mm  
62-07-23112-T274 .070" RIB .031 1.78mm  
62-10-23113-A274 .100" RIB .062 2.54mm  
62-10-23113-T274 .100" RIB .062 2.54mm  
62-13-23114-A274 .130" RIB .062 3.00mm  
62-13-23114-T274 .130" RIB .062 3.00mm  
62-16-23115-A274 .160" RIB .062 4.00mm  
62-16-23115-T274 .160" RIB .062 4.00mm  
62-20-23116-A274 .200" RIB .062 5.00mm  
62-20-23116-T274 .200" RIB .062 5.00mm

### Distributor sheets Ribbed with psa - 18" x 18"

69-12-20838-A274 .040" RIB .031 1.02mm  
69-12-20838-T274 .040" RIB .031 1.02mm  
69-12-20839-A274 .070" RIB .031 1.78mm  
69-12-20839-T274 .070" RIB .031 1.78mm  
69-12-20836-A274 .100" RIB .062 2.54mm  
62-12-20836-T274 .100" RIB .062 2.54mm  
62-12-20840-A274 .130" RIB .062 3.00mm  
62-12-20840-T274 .130" RIB .062 3.00mm  
62-12-20841-A274 .160" RIB .062 4.00mm  
62-12-20841-T274 .160" RIB .062 4.00mm  
62-12-20837-A274 .200" RIB .062 5.00mm  
62-12-20837-T274 .200" RIB .062 5.00mm

OEM sheets available – Typically 9" X 9"  
Custom die-cut parts on sheets, or as individual parts  
"A" version offered die-cut (up to 70 mil) on continuous rolls (higher volumes)  
Custom thicknesses available upon request (up to 1" thick)



RIB DIMENSIONS, inch (mm) 274 Series Only *						
	Y072	Y073	Y074	Y075	Y076	Y077
A	.031 (.787)	.031 (.787)	.062 (1.57)	.062 (1.57)	.062 (1.57)	.062 (1.57)
B	.062 (1.57)	.062 (1.57)	.125 (3.17)	.125 (3.17)	.125 (3.17)	.125 (3.17)
C	.040 (1.02)	.070 (1.78)	.100 (2.54)	.130 (3.30)	.160 (4.06)	.200 (5.08)

## Part Number Examples:

Standard OEM Sheet, .070 Thick, "G" carrier, no PSA, 174 material: 61 - 07 - 0909 - G174  
Standard OEM Sheet, .200 Thick, "A" carrier, with PSA, 574 material: 62 - 20 - 0909 - A574  
Custom configuration, "A" carrier, with PSA, 274 material: 69 - 12 - XXXXX - A274  
(Where "XXXXX" is assigned by Chomerics at time of quotation)

## THERM-A-GAP T174, A174 AND F174 MATERIALS

### **Most Economical – Moderate Performance**

The 174 Series materials are ideal for high-volume, cost-sensitive applications that do not require the interface material to possess a special profile. These products have been designed into numerous applications, including laptop computers and automotive electronics packages. Performance properties are similar to those of the 274 Series materials, but availability is limited to flat sheets.

Standard thicknesses for each of these materials are shown in the table below. Pressure-sensitive adhesive is standard on A174 and T174, while the F174 material is inherently self-adhering.

While custom molding is not available for the 174 Series, these materials can be provided die-cut to customer specification. Standard sheet sizes are 9 x 9 in. (23 x 23 cm) and 18 x 18 in. (45 x 45 cm). (*These materials are available in rolls.*)

#### TYPICAL PROPERTIES

#### T174

#### A174

#### F174

Composition

Aluminum Oxide Filled Silicone on  
Fiberglass Reinforced Carrier

Aluminum Oxide Filled Silicone on  
Aluminum Foil Carrier

Aluminum Oxide Filled Silicone  
with Interior Fiberglass Mesh

## THERM-A-GAP T274 AND A274 MATERIALS

### **Moderate Performance, Ribbed Profile Option, Custom Molded Shapes**

The "original" THERM-A-GAP materials, the widely used 274 Series offers good thermal performance, a choice of standard flat or ribbed profiles, and the ability to be molded into virtually any shape or special profile. Used as PCB "blankets" or in elaborate molded configurations, they have been designed into applications as divergent as cellular phone infrastructure equipment, avionics packages, automotive electronics, and advanced HPLC instrumentation systems. Special profiles have

enabled these materials to meet extremely challenging performance requirements, such as efficient cooling of multi-processor workstations.

Standard thicknesses for each material are shown in the table below. Pressure-sensitive adhesive is standard on both A274 and T274. Standard sheet sizes for flat materials are 9 x 9 in. (23 x 23 cm) and 18 x 18 in. (46 x 46 cm). For ribbed materials, the standard sheet size is 8 x 8 in. (20 x 20 cm). Both materials can be provided in non-standard sheet sizes or die-cut to customer specification.

#### TYPICAL PROPERTIES

#### T274

#### A274

Composition

Aluminum Oxide Filled Silicone on  
Fiberglass Reinforced Carrier

Aluminum Oxide Filled Silicone on  
Aluminum Foil Carrier

## THERM-A-GAP A574 AND F574 MATERIALS

### **Superior Performance – High**

The 574 Series materials provide superior thermal performance and are softer than the other THERM-A-GAP materials. Their flexible, elastic nature allows them to blanket highly uneven surfaces, drawing away and transferring heat from components such as microprocessors, video chips and power devices.

A574 material consists of an extremely soft silicone elastomer loaded with ceramic particles, coated onto a 5-mil (.127 mm) aluminum carrier. The F574 material

consists of a ceramic blend filling a fiberglass mesh carrier.

Standard thicknesses for each material are shown in the table below. Pressure-sensitive adhesive is standard on A574, while the F574 material is inherently self-adhering. Both sizes are offered in standard and custom die-cut configurations. Standard sheets are 9 x 9 in. (23 x 23 cm) and 18 x 18 in. (46 x 46 cm). Contact Chomerics for information concerning custom sheet dimensions or rolls.

#### TYPICAL PROPERTIES

#### A574

#### F574

Composition

Ceramic-Filled-Silicone Elastomer on 5 mil  
Aluminum Carrier

Ceramic Filled Silicone  
with Interior Fiberglass Mesh