

Gap Filler 1000 (Two-Part)

Thermally Conductive, Liquid Gap Filling Material

Features and Benefits

- Thermal conductivity: 1.0 W/m-K
- Ultra-conforming, designed for fragile and low-stress applications
- Ambient and accelerated cure schedules
- 100% solids – no cure by-products
- Excellent low and high temperature mechanical and chemical stability



Gap Filler 1000 is a thermally conductive, liquid gap filling material. It is supplied as a two-component, room or elevated temperature curing system. The material is formulated to provide a balance of cured material properties highlighted by a low modulus and good compression set (memory). The result is a soft, thermally conductive, form-in-place elastomer ideal for coupling “hot” electronic components mounted on PC boards with an adjacent metal case or heat sink. Before cure, Gap Filler 1000 flows under pressure like a grease. After cure, it does not pump from the interface as a result of thermal cycling. Unlike thermal grease, the cured product is dry to the touch. Unlike cured gap filling materials, the liquid approach offers infinite thickness with little or no stress during displacement and eliminates the need for specific pad thickness and die-cut shapes for individual applications. Gap Filler 1000 is intended for use in thermal interface applications when a strong structural bond is not required.

GAP PAD

TYPICAL PROPERTIES OF GAP FILLER 1000

PROPERTY	IMPERIAL VALUE	METRIC VALUE	TEST METHOD
Color / Part A	Gray	Gray	Visual
Color / Part B	White	White	Visual
Viscosity as Mixed (cps) (1)	100,000	100,000	ASTM D2196
Density (g/cc)	1.6	1.6	ASTM D792
Mix Ratio	1:1	1:1	—
Shelf Life @ 25°C (months)	6	6	—
PROPERTY AS CURED			
Color	Gray	Gray	Visual
Hardness (Shore 00) (2)	30	30	ASTM D2240
Heat Capacity (J/g-K)	1.0	1.0	ASTM E1269
Continuous Use Temp (°F) / (°C)	-76 to 347	-60 to 175	—
ELECTRICAL AS CURED			
Dielectric Strength (V/mil)	500	500	ASTM D149
Dielectric Constant (1000 Hz)	5.0	5.0	ASTM D150
Volume Resistivity (Ohm-meter)	10 ¹¹	10 ¹¹	ASTM D257
Flame Rating	V-O	V-O	U.L. 94
THERMAL AS CURED			
Thermal Conductivity (W/m-K)	1.0	1.0	ASTM D5470
CURE SCHEDULE			
Pot Life @ 25°C (min) (3)	15	15	—
Cure @ 25°C (min) (4)	60 - 120	60 - 120	—
Cure @ 100°C (min) (4)	5	5	—

1) Brookfield RV, Heli-Path, Spindle TF @ 20 rpm, 25°C.
 2) Thirty second delay value Shore 00 hardness scale.
 3) Time for viscosity to double.
 4) Cure schedule (rheometer - time to read 90% cure)

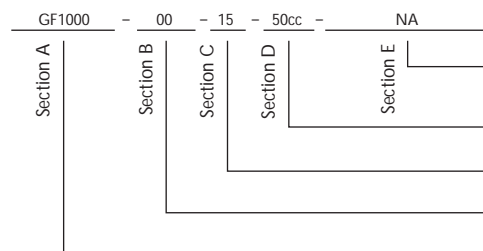
Typical Applications Include:

- Automotive electronics
- Computer and peripherals
- Between any heat-generating semiconductor and a heat sink
- Telecommunications
- Thermally conductive vibration dampening

Configurations Available:

- Supplied in cartridge and kit form

Building a Part Number



Standard Options

◀ example

NA = Selected standard option. If not selecting a standard option, insert company name, drawing number, and revision level.

Cartridges: 50cc = 50.0cc, 400cc = 400.0cc
 Kits: 1200cc = 1200.0cc, or 10G = 10 gallon

Pot Life: 15 = 15 minutes

00 = No spacer beads
 07 = 0.007" spacer beads

GF1000 = Gap Filler 1000 Material

Note: To build a part number, visit our website at www.bergquistcompany.com.

Gap Filler 1100SF (Two-Part)

Thermally Conductive, Silicone-Free, Liquid Gap Filling Material

Features and Benefits

- Thermal conductivity: 1.1 W/m-K
- No silicone outgassing or extraction
- Ultra-conforming, designed for fragile and low-stress applications
- Ambient and accelerated cure schedules
- 100% solids – no cure by-products

Gap Filler 1100SF is the thermal solution for silicone-sensitive applications. The material is supplied as a two-part component, curing at room or elevated temperatures. The material exhibits low modulus properties then cures to a soft, flexible elastomer, helping reduce thermal cycling stresses during operation and virtually eliminating stress during assembly of low-stress applications.

The two components are colored to assist as a mix indicator (1:1 by volume). The mixed system will cure at ambient temperature. Unlike cured thermal pad materials, the liquid approach offers infinite thickness variations with little or no stress during assembly displacement. Gap Filler 1100SF, although exhibiting some natural tack characteristics, is not intended for use in thermal interface applications requiring a mechanical structural bond.

Application

Gap Filler 1100SF can be mixed and dispensed using dual-tube cartridge packs with static mixers and manual or pneumatic gun or high volume mixing and dispensing equipment (application of heat may be used to reduce viscosity).

TEMPERATURE DEPENDENCE OF VISCOSITY

The viscosity of the Gap Filler 1100SF material is temperature dependent. The table below provides the multiplication factor to obtain viscosity at various temperatures. To obtain the viscosity at a given temperature, look up the multiplication factor at that temperature and multiply the corresponding viscosity at 25°C.

Temperature °C	Multiplication Factor	
	Part A	Part B
20	1.43	1.57
25	1.00	1.00
35	0.58	0.50
45	0.39	0.30
50	0.32	0.24

Example - Viscosity of Part A @ 45°:

Viscosity of Part A at 25°C is 450,000 cp. The multiplication factor for part A at 45°C is 0.39. Therefore:

$$(450,000) \times (0.39) = 175,500 \text{ cps}$$

TYPICAL PROPERTIES OF GAP FILLER 1100SF

PROPERTY	IMPERIAL VALUE	METRIC VALUE	TEST METHOD
Color / Part A	Yellow	Yellow	Visual
Color / Part B	Red	Red	Visual
Viscosity as Mixed (cps) (1)	450,000	450,000	ASTM D2196
Density (g/cc)	2.0	2.0	ASTM D792
Mix Ratio	1:1	1:1	—
Shelf Life @ 25°C (months)	6	6	—
PROPERTY AS CURED			
Color	Orange	Orange	Visual
Hardness (Shore 00) (2)	60	60	ASTM D2240
Heat Capacity (J/g-K)	0.9	0.9	ASTM E1269
Continuous Use Temp (°F) / (°C)	-76 to 257	-60 to 125	—
ELECTRICAL AS CURED			
Dielectric Strength (V/mil)	400	400	ASTM D149
Dielectric Constant (1000 Hz)	5.0	5.0	ASTM D150
Volume Resistivity (Ohm-meter)	10 ¹⁰	10 ¹⁰	ASTM D257
Flame Rating	V-O	V-O	U.L. 94
THERMAL AS CURED			
Thermal Conductivity (W/m-K)	1.1	1.1	ASTM D5470
CURE SCHEDULE			
Pot Life @ 25°C (3)	240 min (4 hr)	240 min (4 hr)	—
Cure @ 25°C (hrs) (4)	24	24	—
Cure @ 100°C (min) (4)	10	10	—

1) Brookfield RV, Heli-Path, Spindle TF @ 2 rpm, 25°C.
 2) Thirty second delay value Shore 00 hardness scale.
 3) Time for viscosity to double.
 4) Cure schedule (rheometer - time to read 90% cure)

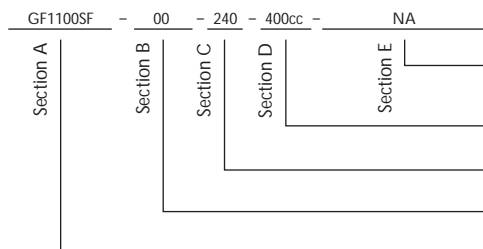
Typical Applications Include:

- Silicone-sensitive optic components
- Silicone-sensitive electronics
- Filling various gaps between heat-generating devices to heat sinks and housings
- Mechanical switching relay
- Hard disk assemblies
- Dielectric for bare-leaded devices

Configurations Available:

- Supplied in cartridge or kit form

Building a Part Number



Standard Options

◀ example

NA = Selected standard option. If not selecting a standard option, insert company name, drawing number, and revision level.

Cartridges: 400cc = 400.0cc
 Kits: 1200cc = 1200.0cc, or 10G = 10 gallon

Pot Life: 240 = 240 minutes

00 = No spacer beads
 07 = 0.007" spacer beads

GF1100SF = Gap Filler 1100SF Material

Note: To build a part number, visit our website at www.bergquistcompany.com.

Gap Filler 1500 (Two-Part)

Thermally Conductive Liquid Gap Filling Material

Features and Benefits

- Thermal conductivity: 1.8 W/mK
- Optimized shear thinning characteristics for ease of dispensing
- Excellent slump resistance (stays in place)
- Ultra-conforming with excellent wet-out for low stress interface applications
- 100% solids – no cure by-products
- Excellent low and high temperature mechanical and chemical stability



Gap Filler 1500 is a two-part, high performance, thermally conductive liquid gap filling material, which features superior slump resistance and high shear thinning characteristics for optimized consistency and control during dispensing. The mixed system will cure at room temperature and can be accelerated with the addition of heat. Unlike cured thermal pad materials, a liquid approach offers infinite thickness variations with little or no stress to the sensitive components during assembly. Gap Filler 1500 exhibits low level natural tack characteristics and is intended for use in applications where a strong structural bond is not required. As cured, Gap Filler 1500 provides a soft, thermally conductive, form-in-place elastomer that is ideal for fragile assemblies and filling unique and intricate air voids and gaps.

TYPICAL PROPERTIES OF GAP FILLER 1500

PROPERTY	IMPERIAL VALUE	METRIC VALUE	TEST METHOD
Color / Part A	Yellow	Yellow	Visual
Color / Part B	White	White	Visual
Viscosity as Mixed (cps) (1)	250,000	250,000	ASTM D2196
Density (g/cc)	2.7	2.7	ASTM D792
Mix Ratio	1:1	1:1	—
Shelf Life @ 25°C (months)	6	6	—
PROPERTY AS CURED			
Color	Yellow	Yellow	Visual
Hardness (Shore 00) (2)	50	50	ASTM D2240
Heat Capacity (J/g-K)	1.0	1.0	ASTM D1269
Continuous Use Temp (°F) / (°C)	-76 to 347	-60 to 175	—
ELECTRICAL AS CURED			
Dielectric Strength (V/mil)	400	400	ASTM D149
Dielectric Constant (1000 Hz)	6.4	6.4	ASTM D150
Volume Resistivity (Ohm-meter)	10 ¹⁰	10 ¹⁰	ASTM D257
Flame Rating	V-O	V-O	U.L. 94
THERMAL AS CURED			
Thermal Conductivity (W/m-K)	1.8	1.8	ASTM D5470
CURE SCHEDULE			
Pot Life @ 25°C (min) (3)	60	60	-
Cure @ 25°C (hrs) (4)	5	5	-
Cure @ 100°C (min) (4)	2	2	-

1) Brookfield RV, Heli-Path, Spindle TF @ 20 rpm, 25°C.
 2) Thirty second delay value Shore 00 hardness scale.
 3) ARES Parallel Plate Rheometer - Working life as liquid, time for viscosity to double.
 4) ARES Parallel Plate Rheometer - Estimated time to reach 90% cure.

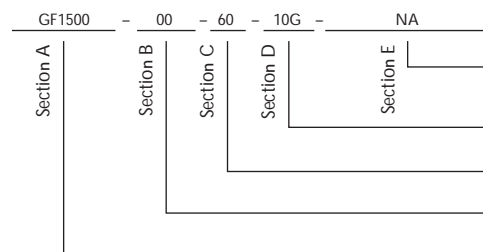
Typical Applications Include:

- Automotive electronics
- Computer and peripherals
- Between any heat generating semiconductor and a heat sink
- Telecommunications
- Thermally conductive vibration dampening

Configurations Available:

- Supplied in cartridge or kit form
- With or without glass beads
- Many other special or custom configurations are available upon request

Building a Part Number



Standard Options

◀ example

NA = Selected standard option. If not selecting a standard option, insert company name, drawing number, and revision level.

Cartridges: 50cc = 50.0cc, 400cc = 400.0cc
 Kits: 1200cc = 1200.00cc, 10G = 10 gallon

Pot Life: 60 = 60 min

00 = No spacer beads, 07 = 0.007" spacer beads,
 10 = 0.010" spacer beads

GF1500 = Gap Filler 1500 (Two-Part) Material

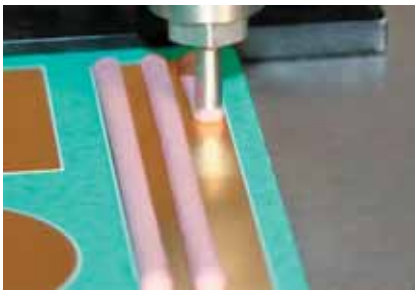
Note: To build a part number, visit our website at www.bergquistcompany.com.

Gap Filler 2000 (Two-Part)

Thermally Conductive, Liquid Gap Filling Material

Features and Benefits

- Thermal conductivity: 2.0 W/m-K
- Ultra-conforming, designed for fragile and low-stress applications
- Ambient and accelerated cure schedules
- 100% solids – no cure by-products
- Excellent low and high temperature mechanical and chemical stability



Gap Filler 2000 is a high performance, thermally conductive, liquid gap filling material supplied as a two-component, room or elevated temperature curing system. The material provides a balance of cured material properties and good compression set (memory). The result is a soft, form-in-place elastomer ideal for coupling "hot" electronic components mounted on PC boards with an adjacent metal case or heat sink. Before cure, it flows under pressure like grease. After cure, it won't pump from the interface as a result of thermal cycling and is dry to the touch.

Unlike cured Gap Filling materials, the liquid approach offers infinite thickness with little or no stress during displacement and assembly. It also eliminates the need for specific pad thickness and die-cut shapes for individual applications.

Gap Filler 2000 is intended for use in thermal interface applications when a strong structural bond is not required.

TYPICAL PROPERTIES OF GAP FILLER 2000			
PROPERTY	IMPERIAL VALUE	METRIC VALUE	TEST METHOD
Color / Part A	Pink	Pink	Visual
Color / Part B	White	White	—
Viscosity as Mixed (cps) ⁽¹⁾	300,000	300,000	ASTM D2196
Density (g/cc)	2.9	2.9	ASTM D792
Mix Ratio	1:1	1:1	—
Shelf Life @ 25°C (months)	6	6	—
PROPERTY AS CURED			
Color	Pink	Pink	Visual
Hardness (Shore 00) ⁽²⁾	70	70	ASTM D2240
Heat Capacity (J/g-K)	1.0	1.0	ASTM D1269
Continuous Use Temp (°F) / (°C)	-76 to 392	-60 to 200	—
ELECTRICAL AS CURED			
Dielectric Strength (V/mil)	500	500	ASTM D149
Dielectric Constant (1000 Hz)	7	7	ASTM D150
Volume Resistivity (Ohm-meter)	10 ¹¹	10 ¹¹	ASTM D257
Flame Rating	V-O	V-O	U.L. 94
THERMAL AS CURED			
Thermal Conductivity (W/m-K)	2.0	2.0	ASTM D5470
CURE SCHEDULE			
	SCHEDULE 1	SCHEDULE 2	SCHEDULE 3
Pot Life @ 25°C ⁽³⁾	15 min	60 min	600 min (10 hr)
Cure @ 25°C ⁽⁴⁾	1-2 hours	3-4 hours	3 days
Cure @ 100°C ⁽⁴⁾	5 min	15 min	1 hour
<small>1) Brookfield RV, Heli-Path, Spindle TF @ 20 rpm, 25°C. 2) Thirty second delay value Shore 00 hardness scale. 3) Time for viscosity to double. 4) Cure schedule (rheometer - time to read 90% cure)</small>			

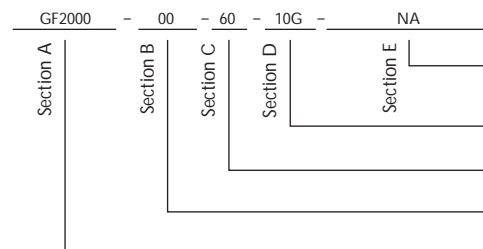
Typical Applications Include:

- Automotive electronics
- Computer and peripherals
- Between any heat-generating semiconductor and a heat sink
- Telecommunications
- Thermally conductive vibration dampening

Configurations Available:

- Supplied in cartridge or kit form

Building a Part Number



Standard Options

◀ example

NA = Selected standard option. If not selecting a standard option, insert company name, drawing number, and revision level.

Cartridges: 50cc = 50.0cc, 400cc = 400.0cc
 Kits: 1200cc = 1200.0cc, or 10G = 10 gallon

Pot Life: 15 = 15 minutes, 60 = 60 minutes
 600 = 600 minutes

00 = No spacer beads
 07 = 0.007" spacer beads

GF2000 = Gap Filler 2000 Material

Note: To build a part number, visit our website at www.bergquistcompany.com.

Gap Filler 3500S35 (Two-Part)

Thermally Conductive Liquid Gap Filling Material

Features and Benefits

- Thermal Conductivity: 3.6 W/m-K
- Thixotropic nature makes it easy to dispense
- Two-part formulation for easy storage
- Ultra-conforming - designed for fragile and low stress applications
- Ambient or accelerated cure schedules



Gap Filler 3500S35 is the technology leader in thermally conductive, liquid gap filling materials, featuring ultra-high thermal performance and superior softness. The material is two-component, cured either at room or elevated temperature. Prior to curing, the material maintains good thixotropic characteristics as well as low viscosity. The result is a gel-like liquid material designed to fill air gaps and voids yet flow when acted upon by an external force (e.g. dispensing or assembly process). The material is an excellent solution for interfacing fragile components with high topography and/or stack-up tolerances to a universal heat sink or housing. Once cured, it remains a low modulus elastomer designed to assist in relieving CTE stresses during thermal cycling yet maintain enough modulus to prevent pump-out from the interface. Gap Filler 3500S35 will lightly adhere to surfaces, thus improving surface area contact. Gap Filler 3500S35 is not designed to be a structural adhesive.

GAP PAD

TYPICAL PROPERTIES OF GAP FILLER 3500S35			
PROPERTY	IMPERIAL VALUE	METRIC VALUE	TEST METHOD
Color / Part A	White	White	Visual
Color / Part B	Blue	Blue	Visual
Viscosity as Mixed (cps) (1)	150,000	150,000	ASTM D2196
Density (g/cc)	3.0	3.0	ASTM D792
Mix Ratio	1:1	1:1	—
Shelf Life @ 25°C (months)	5	5	—
PROPERTY AS CURED			
Color	Blue	Blue	Visual
Hardness (Shore 00) (2)	35	35	ASTM D2240
Continuous Use Temp (°F) / (°C)	-76 to 392	-60 to 200	—
ELECTRICAL AS CURED			
Dielectric Strength (V/mil)	275	275	ASTM D149
Dielectric Constant (1000 Hz)	8.0	8.0	ASTM D150
Volume Resistivity (Ohm-meter)	10 ⁹	10 ⁹	ASTM D257
Flame Rating	V-O	V-O	U.L. 94
THERMAL AS CURED			
Thermal Conductivity (W/m-K)	3.6	3.6	ASTM D5470
CURE SCHEDULE			
Pot Life @ 25°C (min) (3)	60	60	—
Cure @ 25°C (hrs) (4)	15	15	—
Cure @ 100°C (min) (4)	30	30	—
1) Brookfield RV, Heli-Path, Spindle TF @ 20 rpm, 25°C. 2) Thirty second delay value Shore 00 hardness scale. 3) Time for viscosity to double. 4) Cure schedule (rheometer - time to read 90% cure)			

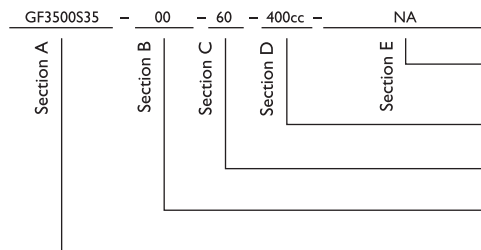
Typical Applications Include:

- Automotive electronics
- Discrete components to housing
- PCBA to housing
- Fiber optic telecommunications equipment

Configurations Available:

- Supplied in cartridge or kit form

Building a Part Number



Standard Options

◀ example

NA = Selected standard option. If not selecting a standard option, insert company name, drawing number, and revision level.

Cartridges: 50cc = 50.0cc, 400cc = 400.0cc
 Kits: 1200cc = 1200.0cc, or 6G = 6 gallon

Pot Life: 60 = 60 minutes

00 = No spacer beads
 07 = 0.007" spacer beads

GF3500S35 = Gap Filler 3500S35 Material

Note: To build a part number, visit our website at www.bergquistcompany.com.