CHEMICALS & PRINTED CIRCUIT

Contents:

NEW PRODUCTS

Big Bath³ Contact Cleaner

Big Bath³ Contact Cleaner is the replacement choice for HCFC 141b cleaners (contains no HCFC's or CFC's). It is non-flammable, non-ozone depleting, and is safe on some plastic. This non-residue cleaner is effective on switches, PC boards, motors, electrical and electronic components. Big Bath³ helps dissipate moisture, and is fast drying.

Applications:
Can be used on live circuits, including switches, relays, controls PC boards, motors, electrical and electronic components. Test for compatibility with sensitive plastics. Incompatible with ABS, PS, and Lexan.

Environmental Data:
CFC: 0% HCFC: 0% ODP: 0 VOC: 56%

Part No. 19-907	16 oz. Anti-Static Aerosol	Replaces Part No. **19-902-SF & 19-903-SF**

Big Bath³ Contact Cleaner and Degreaser

Big Bath³ Cleaner and Degreaser is an excellent general purpose cleaner/degreaser. The product is non-ozone depleting (contains no HCFC's or CFC's). It is a replacement for cleaner/degreasers containing HCFC 141b. Big Bath³ Cleaner and Degreaser will dissipate moisture and is safe on some plastics.

Applications:
General cleaning and degreasing applications, electronic and electrical equipment. Test for compatibility with sensitive plastics. Incompatible with ABS, PS, and Lexan. Can be used on energized circuits.

Environmental Data:
CFC: 0% HCFC: 0% ODP: 0 VOC: 58%

Part No. 19-905	12 oz. Aerosol	Replaces Part No. **19-902**, **19-903-6**, **19-2903-3**
Part No. 19-906	16 oz. Aerosol	Replaces Part No. **19-903** & **19-2903-8**

Phone (815)316-9080•Fax (815)316-9081

All quantities are single; BU's are packages of 10 Unless otherwise noted.

Part No. 19-158

Part No. 19-159

Electronic Grade Silicone Sealant/Adhesive

One part non-corrosive, neutral cure electronic grade silicone sealant. Will remain flexible from -70º F to +400º F. (-57º C to +204º C) An excellent adhesive for many electrical and electronic applications where corrosion to metals is a problem. Good dielectric properties, high surface resistivity and resists electrical tracking.

Part No. 19-158 10.2 fl. oz. Caulk Tube Color: White

Part No. 19-159 2.8 fl. oz. Cartridge Color: ~~White~~ Clear

GC Electronic Grade Self Leveling Potting Silicone Sealant

Electronic Grade Self Leveling Silicone is a one-component, RTV (room temperature vulcanizing) product that uses new cross-linking mechanism as a cure method. No acetic or other corrosive by-products are generated during the curing process. It can be used in corrosion sensitive electrical or electronic equipment with no adverse effect and cures at room temperature.

Temperature Range (after cure):	-57°C to +204°C (-70°F to + 400°F)
Dielectric Strength:	452 V/mil (173 KV/cm)
Thermal Expansion Coefficient:	9×10^4 1/K 0°C to 100°C (32°F to 212°F)
Volume Resistivity:	$>2.19 \times 10^{15}$ Ohm/cm

Part No. 19-160 10.2 fl. oz. Caulk Tube Clear

GC™ ELECTRONICS

PRODUCT SPECIFICATIONS SHEET

CAT NO.	PRODUCT NAME
19-158	GC Electronic Grade Silicone Sealant Adhesive – White
19-159	Clear

DESCRIPTION:

GC Electronic Grade Silicone Sealant/Adhesive is a one-part, moisture-curing RTV (room temperature vulcanizing) silicone sealant/adhesive that is non-slump and cures to form a tough, permanently flexible rubber.

The non-corrosive curing system of these products makes it ideally suited for protecting, sealing and insulating corrosion-sensitive electronic and electrical materials such as copper, brass, silver, etc.

It has been specifically formulated for use in electrical/electronic production and assembly because it

- has good dielectric properties
- has high surface resistivity
- resists electrical tracking
- repels water to protect electrical properties

These products are a neutral-cure silicone that emits no objectionable odors during cure and is ideally suited for use in confined areas. However, adequate ventilation should be provided when they are used in large-scale production.

These products are 100% silicone and have excellent resistance to:

- ozone
- UV
- airborne chemicals
- temperature changes from -57°C to +204°C (-70°F to +400°F)

TYPICAL USES:

19-158 and 19-159 are excellent sealants/adhesives for many electrical and electronic applications where corrosion to metals, particularly copper, brass, silver, etc., is a problem. Such applications include:

- lead-wire entries
- conduit terminal boxes
- component mounting
- electrical connections
- conduit ends
- splices
- cover plates
- coaxial cable connectors
- printed circuit boards
- conductor entry holes

SURFACE PREPARATION;

All surfaces should be clean and dry. It is recommended that bonding surfaces be solvent wiped with oil-free solvents such as xylol, toluol naphtha or non-flammable chlorinated solvents. Do not wipe with oil-based solvents such as Varsol. Allow surface to dry thoroughly before applying sealants.

DIRECTIONS:

19-158 and 19-159 are ready to use and require no mixing or additives. The cure mechanism begins as soon as the sealant comes in contact with the air. At conditions of 25°C (77°F) and 50% relative humidity, the sealant will skin in 15 minutes and fully cure within 48 hours (1/8" bead).

Higher humidity accelerates cure. Tooling should be done before skinning takes place.

In applications where partial total confinement of sealant is prevalent, the time required for proper cure is lengthened by the degree of confinement.

PRIMING:

Priming of these products is normally not required for application to most substrates.

Unprimed adhesion can be readily tested by applying a small trial bead and allowing 7 days for maximum adhesion to occur.

COLORS:

These products are available in white.

MILITARY SPECIFICATIONS:

19-158 and 19-159 meet the requirements of MIL-A-46146A Type 1.

FDA STATUS:

19-158 and 19-159 are permitted under regulations of the Food and Drug Administration where incidental food contact might be involved. FDA Regulation number is 177.2600.

TYPICAL PROPERTIES:

CHARACTERISTIC	TEST METHOD	RESULTS
Shore A Hardness	ASTM D2240	30 ± 2
Tensile @ Break	ASTM D412	250 ± 25 psi
Elongation @ Break	ASTM D412	400 ± 25%
Modulus @ 100% Elongation	ASTM D412	90 ± 10 psi
Tear Strength	ASTM 624 (Die B)	30 ± 10 ppi
Adhesion Strength (Peel)	TT-S-001543, 3.5.9	
Glass		10 ± 2 ppi
Aluminum (Primed)		8 ± 2 ppi
Mortar (Primed)		12 ± 2 ppi
Sag, or Slump	TT-S-001543, 3.5.2	Nil
Shrinkage (Weight Loss)	TT-S-001543, 3.5.5	<5%
Extrusion Rate	1/8" orifice @ 50 psi	130 ± 5 gm/min

CHARACTERISTIC	TEST METHOD	RESULTS
Service Temperature		-18°C to +50°C 0°F to + 120°F
Tack Free Time	TT-S-001543, 3.5.6	15 minutes
Time to Full Cure (1/8" Bead)		48 hours
Joint Movement Capability	4:1 Safety Factor	± 25%
Chemical Resistance	List Available	Excellent
Color Retention		Excellent
Weatherability		Excellent
Reactivity of Byproducts		Non-corrosive to Most substrates
Electrical Properties @ 72°F (22°C)		
Dissipation Factor	ASTM D150	50 Hz – 0.0009 1 kHz – 0.0004 1 MHz – 0.0002
Dielectric Constant	ASTM D150	50 Hz – 2.7 1 kHz – 2.7 1 MHz – 2.7
Volume Resistivity, Ω.cm	ASTM D257	2×10^{14}
Surface Resistivity, Ω	ASTM D257	3×10^{15}
Dielectric Strength, KV/mm	ASTM D149	18

SAFETY PRECAUTIONS:

Since GC Electronic Grade Sealant/Adhesive is a neutral-cure system, no acetic or objectionable byproducts are evolved during cure. On direct contact, uncured sealant may irritate eyes. Flush well with water and call physician if irritation persists. Avoid prolonged contact with skin.

STORAGE:

GC Electronic Grade Sealant/Adhesive,should be stored in original unopened container at or below 32°C (90°F),.

SHELF LIFE, CLOSED CONTAINERS:

12 months

GC™ ELECTRONICS

PRODUCT SPECIFICATIONS SHEET

CAT NO. PRODUCT NAME

19-160 GC Electronic Grade Self-Leveling Potting Silicone Sealant

---

DESCRIPTION:

Electronic Grade Self-Leveling Silicone is a one-component, RTV (room temperature vulcanizing) product that uses a new cross-linking mechanism as a curing method. No acetic acid or other corrosive by-products are generated during its cure. Thus, 19-0160 can be used in corrosion-sensitive electrical and/or electronic equipment with no adverse effect.

Supplied ready to use, 19-160 cures at room temperature to form a tough, high-modulus rubber.

TYPICAL USES:

19-160 is primarily used in applications where a flowable, self-leveling silicone sealant is required to fill small gaps or voids. Applications include potting electrical terminals and coating electrical devices.

Since no undesirable odors are released during cure, 19-160 is ideal where applications must be done under confined conditions. Adequate ventilation should be provided with extensive use of this product.

DIRECTIONS:

19-160 is ready to use and requires no mixing or additives. The cure mechanism begins as soon as the sealant comes in contact with the air. Uncured sealant will flow until a cured skin is formed.

At conditions of 25°C (77°F) and 50% relative humidity, the sealant will skin in 30 minutes and cure within 24 hours (1/8” thickness). Higher humidity accelerates cure.

In applications where partial or total confinement of sealant is prevalent, the time required for proper cure is generally lengthened by the degree of confinement.

SURFACE PREPARATION;

All surfaces should be clean and dry. It is recommended that bonding surfaces be solvent wiped with a naphtha, ketone or chlorinated solvent. Suitable solvents include xylol, toluol and mineral spirits. Do not solvent wipe with alcohols or oil-containing solvents such as Varsol. Allow surface to dry thoroughly before applying sealant.

PAINTING:

19-160 should not be applied to surfaces that will be painted, as painting over sealant is not recommended. The paint film does not stretch and the adhesion of paint to 19-0160 is not adequate.

COLORS:
19-160 is available in clear.

FDA STATUS:

19-160 is permitted under regulations of the Food and Drug Administration where incidental food contact might be involved. FDA Regulation number is 177.2600.

MILITARY SPECIFICATIONS:

19-160 meets the requirements of MIL-A-46106A Type II.

TYPICAL PROPERTIES:

UNCURED:

Type	One-part, self-levelling RTV
Appearance	Smooth, thick liquid
Specific Gravity	Clear 1.02
Application Temperature Range	-18°C to +50°C (0°F to +120°F)
Cure Method	Neutral, non-corrosive, moisture cure
Skin Over Time	40 minutes
Cure Time	24 hours (1/8" thickness)
Slump/Sag	Flowable

CURED:

At 25°C (77°F) and 50% R.M. for 7 days (1/8" thick)	
Durometer Hardness (shore A) (ASTM D2240)	25
Tensile Strength (ASTM D412)	230 psi (1.6 MPa)
Elongation at Break (ASTM D412)	400%
Tear Resistance (ASTM D624, Die B)	6 ppi (4.6 kN/m)
Temperature Range After Cure	-57°C to 204°C (-70°F to +400°F)
Shrink Factor	Nil
Thermal Expansion Coefficient	9×10^{-4} 1/K 0°C to 100°C (32°F to 212°F)
Dielectric Strength (ASTM D149)	452 V/mil (173 KV/cm)
Volume Resistivity (ASTM D257)	$>2.19 \times 10^{15}$ ohm/cm
Dissipation Factor (ASTM D150)	0.00106 at 10 kHz 0.00022 at 100 Hz
Dielectric Constant (ASTM D150)	71 at 100 Hz 2.71 at 10 kHz

SAFETY PRECAUTIONS:

19-160 is a neutral cure system, no acetic acid is released during cure.

STORAGE:

19-160 should be stored in original unopened container at or below 32°C (90°F).

SHELF LIFE, CLOSED CONTAINERS

12 months

GC™ ELECTRONICS

PRODUCT SPECIFICATIONS SHEET

CAT NO.	PRODUCT NAME
~~19-161~~	~~GC Thermal Conductive Potting Epoxy and Adhesive~~ 8 oz. Kit (2 – 4 oz. Containers)

Discontinued

DESCRIPTION:

GC Thermal Conductive Potting Epoxy and Adhesive is a highly filled, medium viscosity black casting resin designed for applications requiring a high degree of thermal conductivity, flexibility and a low CTE. It was especially formulated to a 1:1 mix ratio for use in MMD equipment. It contains abrasive aluminum oxide filler which can introduce wear considerations for wetted components. Cure is normally achieved at room temperature although an elevated cure schedule can be used to reach final properties quickly. This product was designed to be cured in less than 2 hours at 65°C for ease of processing and also to reduce viscosity.

It was especially formulated to a 1A:1B volume mix ratio for use in side-by-side dispensing cartridges and meter/mix and dispense equipment. Times and temperatures from 3 hours at 65°C to 30 minutes at 100°C are typical for small castings (less than 50 grams).

TYPICAL PROPERTIES:

Color		Black
Viscosity	Part A	44,000 cPs (Low Shear) 35,000 cPs (High Shear)
	Part B	34,000 cPs (Low Shear) 25,500 cPs (High Shear)
	Mixed	39,000 cPs (Low Shear) 30,000 cPs (High Shear)
Specific Gravity	Part A Part B Mixed	1.92 1.98 1.95
Pot Life		120 minutes
Mass		200 grams

CURED PHYSICAL PROPERTIES:

Hardness	75 Shore-D
Lap Shear	1500 psi

Discontinued

Tensile Strength (Yield)	450 psi
Elongation @ Break	15%
Compressive	**PSI**
Yield Strength	1,500
Ultimate Strength	7,500
Modulus	24,000
Coefficient of Thermal Expansion	45*ppm/°C (below Tg)
Thermal Conductivity (Btu*in/ft^2 hr°F)	7.2
Temperature Range **	-40° to 150°C
Onset Temperature	55°C
Exothermic Energy	63.3 J/g
Glass Transition Temperature	26°C

ELECTRICAL PROPERTIES:

Dielectric Constant (25°C, 100 Hz)	5.0*
Dielectric Strength	400 v/mil*
Volume Resistivity	7.6 x 10^{13} Ohm-Cm*

MIX RATIO: (Part A to B)

By Weight	1 to 1
By Volume	1 to 1

CURE SCHEDULE: 24 – 72 hours at 25°C
Or 3 hours @ 65°C
30 minutes @ 100°C

SHELF LIFE, CLOSED CONTAINERS: 12 months

INSTRUCTIONS:

1) Bring both components to room temperature and stir individually before use. Mix equal parts A and B thoroughly.

2) Weigh and mix parts A and B accurately and thoroughly, scraping sides of container often. Do not pour from mixing container; transfer to a new container as residual unmixed material may cause a tacky spot on the surface of casting.

Discontinued

3) Allow product to cure undisturbed until it is fully gelled or tack-free to the touch.

4) Clean up uncured resin with a suitable organic solvent such as MEK, acetone or other organic solvent.

*Asterisk denotes values considered typical to associated resin systems or extrapolated from other test results.

**General use guideline, based on weight loss at elevated temperature.

Notes: Values presented above are considered to be typical properties, not to be used for specification purposes. Many epoxy resin systems are prone to crystallization as epoxy resin is a super-cooled fluid. This condition may give the product a gritty or grainy appearance (or hazy in clear products). Products in this state will not usually cure to normal and expected properties. In extreme cases it may appear solid and cured. Fluctuating temperatures (within 5-50°C) may aggravate this phenomena. Heating the individual component to 50 to 60°C while stirring can usually restore the product to original state. Storage at 25+/-10°C is optimum for most products.