CHEMICALS

ADHESIVES

GC Electronics offers three basic types of adhesives:

1. **EPOXY CEMENTS: Among the strongest and most universal of all bonding materials. They consist of two parts which must be mixed before applications. Epoxies dry without heat or pressure at room temperature through catalytic action.**
2. **CYANOACRYLATE ADHESIVES: Do not require the use of an added catalyst, nor heat or pressure. Dries within seconds through the process of polymerization.**
3. **SOLVENT-RELEASE ADHESIVES: Resins or polymers in solution. This general category also includes welding type adhesives which create a bond of exceptional strength.**

EPOXY CEMENTS

Two-component, solventless cements which form an exceptionally strong bond (up to 4,000 psi) and they do not shrink on curing. May be used to cement porous and non-porous substances including all metals, glass, ceramics, most plastics, cardboard, wood, rubber, and fiber. They resist moisture, most solvents, acid, and alkalis. The consistency of epoxy is that of semi-fluid or putty. They have a tendency to "fill-in" and will produce strong bonds even if the parts to be cemented do not match perfectly. Epoxy cures at room temperature, but elevated temperatures (up to 80°C) may be employed to speed up the curing time. All GC epoxy cements are easy to prepare as they require a 50/50 composition to be mixed. This can be judged when squeezing out the tube, for the exact ratio is not critical. The working life, often called "pott life" of the mixture, is the time span from mixing the two parts until the chemical reaction starts to harden the compound. A product with short working, and correspondingly short curing time, is indicated where a single repair is to be made and the mixture can be applied immediately after preparation. For production purposes, a type with long pott life should be selected.

Quik Stik
5 Minutes Set

Clear, fast curing epoxy adhesive. In view of its short pott life, use is recommended when a single repair must be made and the mixed adhesives can be used within one or two minutes. Cemented items can be safely handled within eight to twelve minutes, with full hardness obtained after several hours. This cement is relatively thin in consistency and should be used to cement closely matching surfaces. The glue line is usually invisible.

Part No. 10-114 Pkg. of two 1/2 fl. oz. Tubes
Part No. 19-822 Double Syringe .0105 oz.

2 Part Epoxy Super Glue
5–6 Hour Set

Versatile epoxy cement particularly suitable for cementing non-porous materials. Cures at room temperature. Bond strength of over 3000 psi. Will not shrink through curing. Resistant to water, solvents, heat, cold and fungus. Excellent dielectric properties. Mix in equal parts from two tubes.

Part No. 10-100 Pkg. of two 3/4 oz. Tubes

2 Part Epoxy Glue
5 Hours Set

Provides an exceptionally hard and strong bond. Good dielectric properties. Gray-white in color with fillers added to increase viscosity and make it thixotropic (non-running). May be used to fill gaps or to replace broken sections. Bonds may be over-filled and filed or sanded after curing.

Part No. 10-347
Pkg. of two 2 fl. oz. Tubes
N.S.N. 8040-00-281-2308

Epoxy Putty

GC Epoxy Putty is a two part epoxy in a single tube. Amount needed is cut off and kneaded together. Two minute work life. Dielectric strength: 400 volts/mil. Sets hard in 20 minutes, may be drilled and tapped. Max. useful temp. 300° F.

Applications: Plumbing repairs, works under water. Electrical, use in place of tape.

Part No. 19-348 4 oz. Tube

Conductive Epoxy

Electrically conductive silver filled two part for attaching electrical components. Mix ratio 1/1. Pot life 40 min. Cure 24 hours. Vol. res. .005 ohm-cm max.

Part No. 19-2092 .2116 oz. Kit

GC Potting Epoxy

Black opaque epoxy used for potting and encapsulating electronic circuits. Use to environmentally protect or conceal circuits. This product is excellent when used with Chassis Boxes. Working Time (Pott Life), 1 Hour, Mix ratio: 1 to 1, Temperature Range: –40° to 300° F.

Electrical Properties:
Volume Resistivity: 8.3 x 10^{14} Ohm-cm
Dielectric Constant: 3.5 (25°C, 100 Hz)
Dielectric Strength: 410 v/mil

Part No. 19-823 8 oz. Kit (2-4 oz. Bottles)
Part No. 19-824 18 oz. Kit (2-9 oz. Bottles)
Part No. 19-824-2G 2 gal. Kit (two 1 gal. containers)

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

MATERIAL SAFETY DATA SHEET

Complies with OSHA Hazard Communication Standard 29 CFR 1910.1200

Product Type: Adhesive
Product Name: **Epoxy Glue, Part A Resin**
Part Number(s): **10-347**

Section 1 – Identification of Product

Chemical Composition: Mixture
Chemical Family: Epoxy Resin

HMIS RATINGS		Least	0
Health	2	Slight	1
Flammability	1	Moderate	2
Reactivity	0	High	3
Personal Protection	B	Extreme	4
		Gloves, Safety Glasses	B

Section 2 – Hazardous Ingredients

Name	CAS #	OSHA PEL	ACGIH TLV
Bisphenol-A Type Epoxy Resin	25068-38-6	NE	NE
Butyl Glycidyl Ether	2426-08-6	25 ppm	25 ppm
Amorphous Silicon Dioxide	67762-90-7	20 mppcf	NA
Calcium Carbonate	1317-65-3	10 mg/m^3	NA
Carbon Black	1333-86-4	3.5 mg/m^3	3.5 mg/m^3

* Exact identity withheld as a trade secret.

Section 3 – Physical Data

Flash Point (pmcc): > 200°F
Boiling Point: > 400°F
Vapor Density: > Air
% Volatile by Vol.: 0
Specific Gravity: 1.26
Evaporation Rate: Nil
Solubility in Water: Negligible

Vapor Pressure:	< 1 mm Hg
Appearance and Odor:	Gray paste, mild epoxy odor

Section 4 –Fire and Explosion Hazard Data

Extinguishing Media:	Water fog, carbon dioxide, foam or dry chemical.
Special Fire Fighting Procedures:	Full protective equipment including self-contained breathing apparatus should be used. Water spray may be used to cool fire exposed container to prevent pressure build-up and possible auto-ignition or rupture.
Unusual Fire & Explosion Hazards:	Keep containers tightly closed. Water may be used to cool unruptured containers.

Section 5 – Health Hazard Data

Medical conditions prone to aggravation by exposure:	Preexisting disorders of the skin and/or eyes.
Primary Routes of Exposure:	4 Dermal/Eye 4 Inhalation __ Ingestion
Eye Contact:	Contains ingredients which are irritating to the eyes. Symptoms may include blurred vision, burning sensation and tearing.
Skin Contact:	Contains materials which cause moderate skin irritation. This product may cause skin sensitization or allergic reactions which may be severe with certain people. Symptoms include rash, itching, hives and swelling of extremities. Prolonged or repeated exposure may cause a defatting or drying action to skin.
Inhalation:	Unlikely at room temperature due to low volatility, however heating can generate vapors that may cause respiratory irritation.
Ingestion:	Product is harmful if swallowed.
Chronic Health Effects:	The Bisphenol-A epoxy (DGEBA) resin this product contains has been shown to be mutagenic in some microbial tests, but failed to show mutagenicity in others, the significance of this is unknown. Chromosomal abberations were observed in cultured rat liver cells. Two year bioassays on mice exposed by the dermal route to DGEBA resin gave only very limited evidence of weak carcinogenicity. Based on this and other evidence the International Agency for Research on Cancer (IARC) concluded in 1988 that DGEBA epoxy resins are not classifiable as carcinogens. Butyl glycidyl ether may induce mutagenic changes in laboratory test animals. This has not been related to human exposures, however good ventilation and industrial hygiene practices should be followed when handling products containing this ingredient.
Emergency First Aid Procedures:	
Inhalation:	Move person to fresh air. Restore breathing. Treat symptomatically. Consult a physician.
Eyes:	Flush eyes with water for at least 15 minutes. Take to a physician for medical treatment.

Section 10 – Regulatory Information

DOT Proper Shipping Name:	Not Regulated
Hazard Class or Division:	NA
Packing Group Number:	NA
Required Label:	None
Identification Number:	NA
TSCA Status:	All components of this product are listed on, or exempted from the requirement to be listed on, the TSCA inventory.

NA=Not Available
na=not applicable
NE = Not Established
ND = Not Determined
mppcf = million parts/ft3
mg/M3 = milligrams per cubic meter

Section 8 – Special Protection Information

Respiratory Protection:	Avoid breathing vapors/mists. Use approved chemical/mechanical filters designed to remove a combination of particulates and organic vapors in open and restricted areas when ventilation does not meet the requirements of 29 CFR 1910.134. Use approved airline type respirators or hoods in confined areas.
Ventilation:	Sufficient ventilation in pattern and volume to keep the air contaminant concentration below applicable exposure limits. All application areas should be ventilated in accordance with OSHA regulation 29 CFR 1910.134.
Protective Gloves:	Use neoprene or other impervious gloves to prevent skin contact.
Eye Protection:	Use safety glasses with side shields as minimum protection.
Other Protective Equipment:	Use protective cream if skin contact is likely. Remove and wash contaminated clothing before reuse. Discard contaminated shoes.
Hygenic Practices:	Wash hands before eating, smoking or using toilet facilities. Do not smoke in any chemical handling and storage area. Food or beverage should not be consumed anywhere near where this product is handled or stored.

Section 9 – Special Precautions

Handling and Storage:	Do not store near heat or open flame.
Other:	Empty container should not be reused.

Section 10 – Regulatory Information

DOT Proper Shipping Name:	Not Regulated
Hazard Class or Division:	NA
Packing Group Number:	NA
Required Label:	None
Identification Number:	NA
TSCA Status:	All components of this product are listed on, or exempted from the requirement to be listed on, the TSCA inventory.
Proposition 65 Substances (Components) known to the State of California to cause cancer and/or reproductive toxicity and subject to warning and discharge requirements under the "Safe Drinking Water and Toxic Enforcement Act of 1986":	None

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na=not applicable ND=Not Determined mg/M3=milligrams per cubic meter