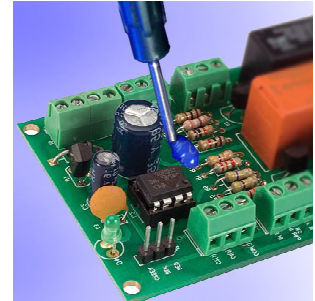


High Performance Epoxies for Special Applications

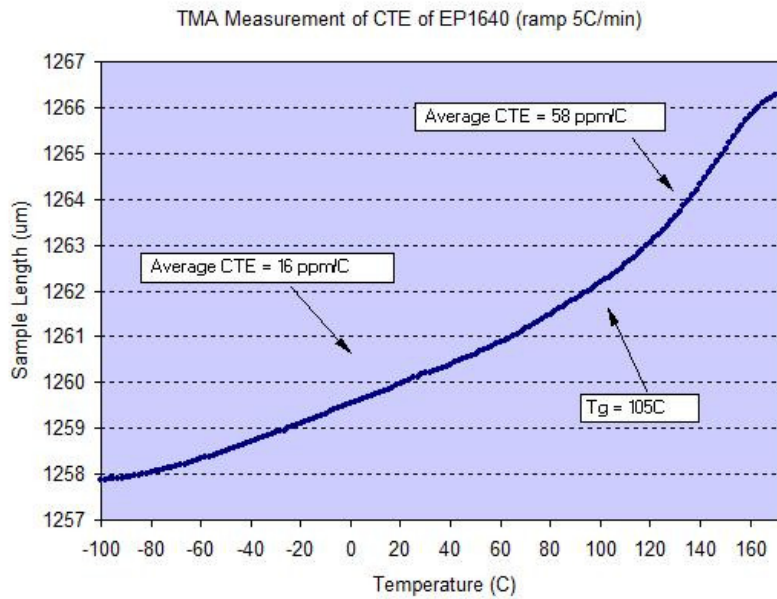
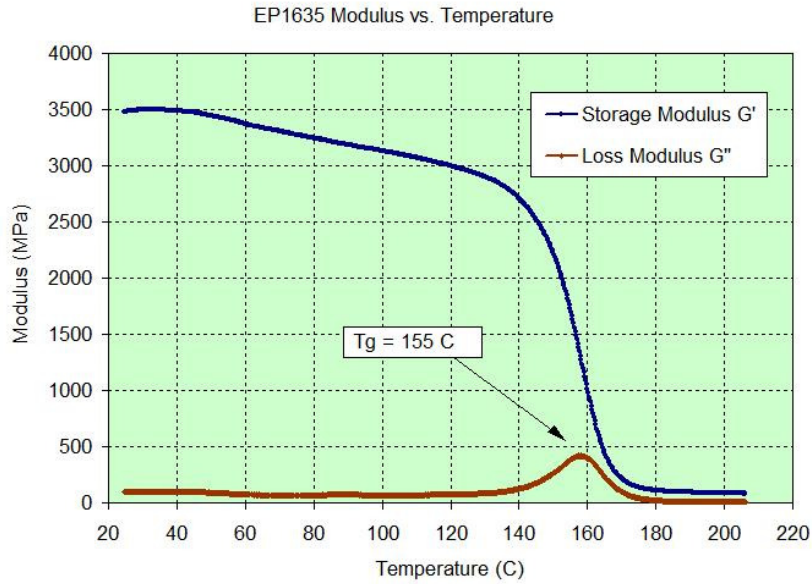
United Adhesives Inc. makes high performance epoxy adhesives for electronic structural bonding, severe thermal shock and vibration bonding, and media resistance applications. Some epoxy adhesives can be used in other industries such as medicine and construction.

- Thixotropic bonding epoxy to anti-sag in processing.
- High Tg formulation for high temperature stability.
- Very low CTE formulation to minimize the thermal mismatch.
- High flow and penetration to fill micro cracks and voids
- Very soft / flexible epoxy formulation offering rubbery flexibility.
- High voltage insulation formulation
- UV curable and pre-UV exposure and curable after assembly.



Name	EP1346	OE1582	EP1635	EP1640	EP1641	EP1660
Features / Advantages	Very Soft / Flexible Epoxy. Rubber like property offering flexibility and chemical stability.	Transparent epoxy potting or sealing for optical or Opto-Electronic Applications.	High Tg formulation for high temperature stability. Strong oil and chemical resistance	Very Low CTE formulation. Excellent oil and chemical resistance	Thixotropic (non-sag) epoxy. Low CTE. Very strong bonding to many plastics and surfaces. Strong oil and chemical resistance.	High Voltage resistance. Low arching effect. Strong oil and chemical resistance.
Typical Application	For low stress bonding and flexible encapsulation. Bond to PBT, PPS, Nylon, PC, Phenolic & other difficult materials.	Applying on LED Glob-Top, Optical Lens & IR Lens, Fiber optical, Lens, Prism, Endoscopes or Light Guides, etc.	For applications that require high temperature stability in semiconductor and automotive electronics such as power devices and processors.	For applications that require extremely low CTE bonding such as silicon / ceramic bonding, ignition coil potting.	For severe thermal shock, vibration bonding applications. Structural bonding applications. Oil and media resistance applications.	For high voltage insulation seal or encapsulation. High voltage component bonding or coating.
Rheology	Flowable, Dispensable	Capillary flowable	Flowable, Dispensable	Flow. Good for Potting	Thixotropic (non-slump). Dispensable	Flowable, Dispensable
Appearance / Color	Light Brown or Grey Liquid	Transparent	Brown or Grey	Off White or Grey	Milky White Brown Or Grey	Milky White or Grey
Part / Component	A/B = 2: 1	A/B =2:1	A/B = 1: 1	A/B = 1: 1	One Part	A/B =1:1
Viscosity @25C (cps, after mixing)	8,000	1,500	12,000	15,000	220,000	12,000
Pot / Work life (hr)	8 hrs	4 hrs	45 min	60 min	8 hrs	45 min
Cure Rate	125C 60 min	80C 60 min 125C 15 min	150C 120 min	RmT 12 hr 125C 30 min	125C 45 min	125C 60 min
Storage	< 25C	< 30C	< 25C	< 25C	< - 40C	< 25C
Shelf Life	12 month @ 24C	> 6 month @ < 30C	12 month @ 24C	12 month @ 24C	> 3 months @ -40C	6month @ 5C
Tg	< 75C	~ 50	155	105	120	125
CTE (ppm/C) ASTM D3386-94	< 150	N/A	< 120 (above Tg) < 60 (below Tg)	< 60 (above Tg) < 18 (below Tg)	62 (above Tg) 19 (below Tg)	120 (above Tg) 60 (below Tg)
Modulus / Hardness	Shore A = 60	Shore D = 77	3.5 Gpa	8.5 Gpa	7.8 Gpa	5.6 Gpa
Volume Resistivity (Ohm-cm)	> 10E12	>10E12	>10E12	>10E12	>10E12	> 10E12
Dielectric Strength (V/mil)	> 400 V/mil	500 V/mil	450 V/mil	500 V/mil	500 V/mil	> 800 VAC/mil
Adhesion (Al/Al Lap Shear)	> 500 psi	> 1200 psi	> 1800 psi	> 1800 psi	> 1800 psi	> 1600 psi

► **Properties of High Performance Epoxies**



EP1660 Voltage Breakdown

Thickness	Initial After Cure	After Humidity Treatment (85C /85% RH 500 hrs)	After Thermal Aging (150C 500 hrs)
1 mil	1100	850	1300
2 mils	1800	1500	2000
5 mil	> 4000	> 4000	> 4000
Average	> 800 volts/mil	> 700 volts/mil	> 800 volts/mil