



## LONG WORKING TIME ~ LOW VISCOSITY KEY PC8060A/B

### DESCRIPTION

TOUGH-SEAL™ ULTRA 60 is a tough and durable longer working time low viscosity potting compound and sealant that flows like maple syrup around electrical components to ensure complete coverage of your entire PCB or electronic assembly. Bulldog tough, TOUGH-SEAL™ ULTRA, can endure over 2000 hours of rigorous reliability testing at 85C/85%, without any signs of degradation or change in hardness, making it an excellent choice for endless electronics applications. The new extended shelf-life TOUGH-SEAL™ 60 ULTRA is RoHS, REACH and Prop 65 Compliant.

### CHARACTERISTICS

- Low Exotherm, Low Shrinkage, Non-Cracking
- Polycarbonate Compatible
- Endures +2000 hours of rigorous reliability testing at 85C/85% RH
- Thermal Cycling -40C to 150C

### ^ Physical Properties

60

Color, Part A	Black
Viscosity at 25°C, cP, Part A, (RVT #5, 20 RPM)	3,800
Specific Gravity at 25°C, Part A	1.07
Color, Part B	Amber
Viscosity at 25°C, cP, Part B, (RVT #5, 20 RPM)	1,300
Specific Gravity at 25°C, Part B	1.00
Density at 25°C, lbs/gal, Part B	8.35
Color, Mix	Black
Viscosity at 25°C, cP, Mix, (RVT #5, 20 RPM)	3000
Specific Gravity at 25°C, Mix	1.05
Density at 25°C, lbs/gal, Mix	8.76
Mix Ratio by Volume	2A to 1B
Mix Ratio by Weight	100A to 46.8B
Gel Time at 25°C, Minutes, 100 grams	60
Shelf Life, Ambient, Part A Bulk (15°C to 35°C)	12 Months
Shelf Life, Ambient, Part B Bulk (15°C to 35°C)	12 Months
Shelf Life, Cold, Part A Bulk (-18°C to 3°C)	12 Months
Shelf Life, Cold, Part B Bulk (-18°C to 3°C)	12 Months

### ✓ Electrical & Thermal Properties

### ✓ Hardness vs Temperature

### ✓ Hardness vs Ambient Cure Time

### ✓ Mechanical Properties

# KEY POLYMER

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^ Electrical & Thermal Properties			60
Dielectric Strength, 25°C, Volts/mil			353
Volume Resistivity, 25°C, Ohm-cm x (10)12			2.48
Dielectric Constant, 25°C - 1 MHz			3.93
Dielectric Constant, 25°C - 1 kHz			4.40
Dielectric Constant, 25°C - 60 Hz			8.40
Dissipation Factor, 25°C - 1 MHz			0.030
Dissipation Factor, 25°C - 1 kHz			0.111
Dissipation Factor, 25°C - 60 Hz			0.686
Heat Capacity Cp, 25°C, J/g°K			NT
Thermal Conductivity, 25°C, W/m°K			0.22
Coefficient of Thermal Expansion, ppm/°C		ppm/°F	
(-) 65°C to 75°C	191	(-) 85°F to 167°F	106
75°C to 100°C	191	167°F to 212°F	106
100°C to 150°C	191	212°F to 302°F	106
^ Hardness vs Temperature			60
(-75°C / -103°F)			N/A
(-25°C / -13°F)			66A
5°C / 41°F			66A
25°C / 77°F			66A
50°C / 122°F			57A
66°C / 150°F			56A
80°C / 176°F			47A
100°C / 212°F			44A
120°C / 248°F			40A
150°C / 302°F			39A
^ Hardness vs Ambient Cure Time			60
1 Hour			N/A
2 Hours			N/A
4 Hours			4A
8 Hours			20A
12 Hours			30A
1 Day			49A
2 Days			56A
3 Hours			61A
4 Hours			63A
1 Week			66A
1 Month			N/A



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### ^ Mechanical Properties

60

**Tensile Strength** per ASTM D638, 25°C, PSI

485

**Elongation** per ASTM D638, Type I, 0.125 in, 25°C

109%

**Tensile Lap Shear Strength** - per ASTM D1002, 25°C, psi \*

<b>METALLICS</b>	Aluminum Bare	407 Co
	Steel Bare	297 Co
	Steel Ground	248 Co
	Primed Steel	N/A
	Galvanized Steel	248 Co
	Tin Plated Steel	N/A
	Chrome Plated Steel	N/A

**Tensile Lap Shear Strength** - per ASTM D3163, 25°C, psi \*\*

<b>FRP</b>	FRP - Polyester Fiberglass	N/A
	Garolite G-9 Melamine/Glass	N/A
	Garolite G-10 Epoxy/Glass	N/A
	Garolite XX Phenolic/Paper	N/A

**Tensile Lap Shear Strength** - per ASTM D3163, 25°C, psi \*\*

<b>THERMOPLASTIC</b>	Acrylic	291 Co
	Acrylic/PVC	N/A
	PVC - Polyvinyl Chloride	393 Co
	CPVC - Chlorinated PVC	N/A
	ABS - Acrylonitrile Butadiene Styrene	286 Co
	PETG - Polyethylene Terephthalate	N/A
	Lexan - Polycarbonate	220 Co
	Nylon 6/6 - Polyamide	311 Co
	Polypropylene	N/A
	Polyethylene LDPE	18 Ad
	Polyethylene HDPE	54 Ad
	Teflon PTFE - Polytetrafluoroethylene	4 Ad
	Noryl - Polyphenylene Oxide/Polystyrene	380 Ad
	Ultem Polyetherimide	335 Co