

N109 W13300 ELLSWORTH DRIVE GERMANTOWN, WI 53022  
262-253-5900 FAX 262-253-5919

**DESCRIPTION:**

*ResinLab® EP1121 Black* is a two-part unfilled, epoxy encapsulant designed for medium to large sized castings. It cures completely at room temperature to a tough, flexible yet soft polymer. It has low viscosity to allow for good wicking and penetration into components and circuitry, and it also gives good air release. Thermal shock and cycling properties are also enhanced by its high elongation, giving it the ability to accommodate differences in the CTEs of varying substrates. It also has very good resistance to water, acids and bases, and most organic solvents.

*EP1121 Black* was formulated to a 1A:1B volume mix ratio for use in side-by-side dispensing cartridges and meter, mix, and dispense (MMD) equipment.

At room temperature, *EP1121 Black* will reach handle cure within 8 - 16 hours and full cure within 24 - 48 hours. Final cure properties can be achieved more quickly by the application of heat after product has gelled. Cure times and temperatures typical for most applications range from 1 hour at 65 °C to 15 minutes at 100 °C. Time to heat substrate must be taken into account with cooler temperatures extending the work time.

**TYPICAL PROPERTIES:**

All properties given are at 25 °C unless otherwise noted.

<b>Property:</b>	<b>Value:1:1</b>	<b>Value:1:2</b>	<b>Test Method or Source:</b>
<b>Color</b>	Black	Black	Visual
<b>Mix Ratio</b>	Part A to Part B	Part A to Part B	Calculated
<b>By weight</b>	1.14 to 1	0.57 to 1	
<b>By volume</b>	1 to 1	1 to 2	
<b>Cure Schedule</b>	24-48 hours @ 25 °C 1 hour @ 65 °C 15 minutes @ 100 °C	96 hours @ 25 °C 1 hour @ 65 °C 15 minutes @ 100 °C	
<b>Viscosity – Part A</b>	2,500 cps @1/s	2,500 cps @1/s	455300006291/Rheometer
<b>Viscosity – Part B</b>	3,000 cps @1/s	3,000 cps @1/s	parallel plate 25mm
<b>Viscosity - Mixed</b>	3,000 cps @1/s	3,000 cps @1/s	
<b>Specific Gravity – Part A</b>	1.11	1.11	Calculated
<b>Specific Gravity – Part B</b>	0.97	0.97	
<b>Specific Gravity - Mixed</b>	1.04	1.04	
<b>Pot Life, defined as the time it takes for initial mixed viscosity to double</b>	21 minutes	20 minutes	455300006291/Rheometer parallel plate 25mm@1/s
<b>Gel Time</b>	97 minutes/100cc sample	78 minutes/100cc sample	455300005339/Gardco Hot Pot Gel Timer
<b>Glass Transition Temperature/Tg</b>	34 °C	5.9 °C	453560822409 by DSC
<b>Peak Exotherm</b>	47 °C after 45 minutes / 40ml sample	48 °C after 45 minutes / 40ml sample	455300005593 by Type K thermocouple – Extrapolated from EP1121 CLEAR
<b>Hardness</b>	60 Shore D	45 Shore A	455300006287/ASTM D2240
<b>Water Absorption</b>	0.19% after 24 hours	N/A	457561824543/ASTM D570

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<b>Tensile Properties:</b>			4535601224470/ASTM
<b>Strength</b>	1,100 psi	N/A	D638/Instron
<b>Elongation</b>	100%		
<b>Modulus</b>	3,300 psi		
<b>Lap Shear Strength</b>			4535601224468/ASTM
<b>0.010" bond line Al to Al</b>	1,000 psi	N/A	D1002/Instron
<b>Compressive Properties:</b>			4535601224467/ASTM
<b>Yield Strength</b>	33,000 psi	N/A	D695/Instron
<b>Compressive Strength</b>	33,000 psi		
<b>Modulus</b>	450,000 psi		
<b>Thermal Conductivity by Transient Plane Heat Source (TPS)</b>	0.21 W/(m.K)	N/A	45376013225604/Thermtest TPS Hot Disk ISO 22007-2
<b>Surface Resistivity</b>	$5.79 \times 10^{13}$ ohm/sq (@ 35 %RH)	N/A	455300006612/ASTM D257
<b>Volume Resistivity</b>	$2.89 \times 10^{12}$ ohm-cm (@ 22 °C)		
<b>Dielectric Constant/Dissipation Factor</b>			455300006513/ASTM D150
<b>@ 100 Hz</b>	3.3, 0.07		
<b>@ 100 kHz</b>	2.6, 0.03	N/A	
<b>Coefficient of Thermal Expansion by TMA</b>	42 ppm/ °C below Tg 242 ppm/ °C above Tg	N/A	455300005340/ASTM E831 TMA, 5 °C/min
<b>Operating Temperature Range</b>	-40 to 150 °C**	-40 to 150 °C**	

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

\*\* Operating Temperature Range is based on average design requirements and is not intended as a guarantee of suitability for all applications operating at that temperature.

\*\*\* This TDS contains values that have been updated. The values reported in this technical data sheet are typical values of the product, and are highly dependent on test conditions and methodology. We actively seek the most precise and accurate ways to measure and interpret performance of our products, and to update estimated values with measured values. The formula has not been revised or changed in any way. Although the values on paper have changed, you can expect the same performance of the product.

## **INSTRUCTIONS:**

1. Bring both components to room temperature prior to mixing.
2. Cartridge format: Mixer should be attached keeping the cartridge vertical and any air pocket purged this way. After the mixer contains material, the mixer tip can be dropped to dispense pre-bleed amount. Attach a new static mixer with each cartridge, then pre-bleed the first 3 inches of dispensed material or until a uniform color is obtained. Maintain adequate velocity during dispensing to ensure complete mixing.
3. Bulk format: 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 the casting. Maintain adequate velocity during dispensing to ensure complete mixing.
4. Allow to cure undisturbed until product is fully gelled or tack-free to the touch.

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

**SHELF LIFE AND STORAGE:**

12 months at 25 °C  
Specialty packaging may be less.

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 to 50 °C) aggravate this phenomenon. Heating the individual component to 50 to 60 °C while stirring can usually restore products to original state. Storage at 25 +/- 10 °C is optimum for most products.