



AN ELLSWORTH ADHESIVES COMPANY 

# TECHNICAL DATA SHEET EP1390 Black

11/12/2018

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

## DESCRIPTION:

Resinlab® EP1390 Black is a RoHS compliant, medium viscosity, self-extinguishing flame retardant epoxy casting resin system. It is recognized under the Component Recognition Program of Underwriters Laboratories Inc., (File# E186034) for UL Standard 94. EP1390 qualifies for a vertical burn rating of V-0 at 3mm thickness. It was designed for medium mass potting for printed wire and circuit boards, coils, chargers and power supply applications.

It has excellent chemical resistance. It cures quickly at room temperature to a tough, semi-rigid polymer. It has good wetting and adhesion to most surfaces and is free flowing to penetrate voids and give good air release.

EP1390 was formulated to a 4A:1B by volume mix ratio for ease of use in side by side dispensing cartridges and meter/mix and dispense equipment. EP1390 will generally reach handle cure at room temperature within 1 to 4 hours depending upon mass and ambient temperature. Full cure usually achieved within 24 – 48 hours. Cure time can be accelerated by the application of heat after product has gelled. Times and temperatures from 2 hours at 60 °C to 30 minutes at 100 °C are typical for most castings (less than 100 grams).

This formula contains soft, low-abrasion fillers which can separate over time, although they have good resistance to hard settling.

## TYPICAL PROPERTIES:

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

Property:	Value:	Test Method or Source:
Color	Black	Visual
Mix Ratio	Part A to Part B	Calculated
By weight	4.96 to 1	
By volume	4 to 1	
Cure Schedule	24-48 hours @ 25 °C 2 hours @60 °C 30 minutes @ 100 °C	
Viscosity – Part A	12,000 cps @1/s	Rheometer parallel plate 25mm@1/s
Viscosity – Part B	4,300 cps	455300006291
Viscosity - Mixed	8,000 cps	
Specific Gravity – Part A	1.33	Calculated
Specific Gravity – Part B	1.07	
Specific Gravity - Mixed	1.28	
Pot Life, defined as the time it takes for initial mixed viscosity to double	50 minutes	Rheometer parallel plate 25mm@1/s 455300006291
Gel Time	95 minutes/100cc sample	455300005339/Gardco Hot Pot Gel Timer
Glass Transition Temperature/Tg	45 °C	453560822409 by DSC
Heat of Reaction	273 J/g	453560822409 by DSC
Hardness	85 Shore D	455300006287/ASTM D2240
Water Absorption	0.05% after 24 hours	457561824543/ASTM D570
Peak Exotherm	31.5 °C after 1 hour and 35 minutes for 40mL sample	455300005593 by Type K thermocouple



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<b>Tensile Properties:</b>		455300006285/ASTM D638
<b>Strength</b>	4,800 psi	
<b>Elongation</b>	1.4%	
<b>Modulus</b>	500,000 psi	
<b>Lap Shear Strength 0.100" bond line Al to Al</b>	2,200 psi	455300005642/ASTM D1002
<b>Compressive Properties:</b>		455300006265/ASTM D695
<b>Strength</b>	19,000 psi	
<b>Modulus</b>	200,000 psi	
<b>Flame Resistance</b>	UL Certified. V-0 @ 3mm thickness.	UL94
<b>Thermal Conductivity by LFA</b>	0.30 W / (m.K)	453560822409/ASTM E1461
<b>Surface Resistivity</b>	9.3 x 10 <sup>15</sup> ohm/sq (@ 20 %RH)	455300006612/ASTM D257
<b>Volume Resistivity</b>	7.1 x 10 <sup>15</sup> ohm-cm (@ 18 °C)	
<b>Dielectric Constant / Dissipation Factor</b>		455300006513/ASTM D150
<b>@ 100 Hz</b>	3.7, 0.008	
<b>@ 100 kHz</b>	3.5, 0.01	
<b>AC Dielectric Strength</b>	410 V/mil*	Estimated
<b>Coefficient of Thermal Expansion by TMA</b>	65 ppm/ °C below Tg 170 ppm/ °C above Tg	455300005340 /ASTM E831 TMA, 5 °C/min
<b>Temperature Range</b>	-40 to 150 °C**	

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

\*\* Temperature Rating 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. A power mixer is suggested such as a 500-1000 rpm device with a mix paddle sufficient to turn material and disperse any filler. 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. Apply heat after product has gelled to accelerate full cure.

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

**SHELF LIFE AND STORAGE:**

6 months DOP at 25 °C in cartridges. Store horizontally.  
12 months at 25 °C Bulk packaging. Specialty packaging may be less.  
This system is prone to settling due to high filler content. Inventory should be rotated on a FIFO (first in, first out) basis.  
Bulk containers should be inverted every two to three weeks to reduce the accumulation of the flame retardant fillers on the bottom of the containers.

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.