

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

DESCRIPTION:

Resinlab[™] EP1112NC Black is a two part unfilled fast curing electronic grade epoxy encapsulant designed for small to medium sized castings. EP1112NC Black is a modified version of the standard EP1112, which utilizes a higher molecular weight aromatic diluent to significantly reduce the tendency for crystallization in the epoxy resin.

EP1112NC Black cures completely at room temperature to a tough, flexible polymer. Its low viscosity allows for good wicking and penetration into components and circuitry and also gives good air release. It has very good resistance to water, acids and bases and most organic solvents. Thermal shock and cycling properties are also enhanced by its high elongation giving it the ability to absorb difference in CTE's of substrates.

It was formulated to a 1A:1B volume mix ratio for use in side-by-side dispensing cartridges and meter/mix and dispense equipment. EP1112NC Black will reach full cure at room temperature within 6 to 12 hours. Cure time can be accelerated by the application of heat after product has gelled. Times and temperatures from 1 hour at 65 °C to 10 minutes at 100 °C are typical for small castings (less than 50 grams).

TYPICAL PROPERTIES:

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

| <i>Property:</i> | <i>Value:</i> | <i>Test Method or Source:</i> |
|---|--|---|
| Color | Black | Visual |
| Mix Ratio By weight By volume | Part A to Part B 1.20 to 1 1.00 to 1 | Calculated |
| Cure Schedule | 1 hour @65 °C 10 minutes @ 100 °C | |
| Viscosity – Part A Viscosity – Part B Viscosity - Mixed | 1,100 cps 800 cps 1,050 cps | Rheometer parallel plate 25mm@1/s 455300006291 |
| Specific Gravity – Part A Specific Gravity – Part B Specific Gravity - Mixed | 1.15 0.98 1.06 | Calculated |
| Pot Life, defined as the time it takes for initial mixed viscosity to double | 10 minutes | Rheometer parallel plate 25mm@1/s 455300006291 |
| Gel Time | 14 minutes 35 seconds/100cc sample | 455300005339/Gardco Hot Pot Gel Timer |
| Glass Transition Temperature/Tg | 23 °C | 453560822409 by DSC |
| Hardness | 70 Shore D | 455300006287/ASTM D2240 |
| Water Absorption | 0.1% after 24 hours | 457561824543/ASTM D570 |
| Peak Exotherm | 132 °C after 27 minutes for 40mL sample | 455300005593 by Type K thermocouple |
| Tensile Properties: | | 455300006285/ASTM D638 |
| Strength Elongation Modulus | 3,000 psi 40% 118,000 psi | |
| Lap Shear Strength 0.010" bond line Al to Al | 900 psi | 455300005642/ASTM D1002/MTS 4535601224468/ASTM D1002 |

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|---|---|--|
| Compressive Properties: | | 455300006265/ASTM D695 |
| Strength | >28,000 psi | |
| Modulus | 210,000 psi | |
| Flame Resistance | Passes Resinlab testing with HB rating at 6.0 mm thickness. Not UL Certified. | UL94 |
| Thermal Conductivity by LFA | 0.14 W / (m.K)* | 453560822409/ASTM E1461 |
| Surface Resistivity | 2.93 x 10 ¹⁵ ohm/sq (@ 52 %RH) | 455300006612/ASTM D257 |
| Volume Resistivity | 4.52 x 10 ¹⁴ ohm-cm (@ 23 °C) | |
| Dielectric Constant / Dissipation Factor | | 455300006513/ASTM D150 |
| @ 100 Hz | 3.55, 0.059 | |
| @ 100 kHz | 2.97, 0.027 | |
| Dielectric Strength | 410 V/mil* | ASTM D149 Method A, immersed in ASTM D3487 Type II Oil |
| Coefficient of Thermal Expansion by TMA | 65 ppm/ °C below Tg 240 ppm/ °C above Tg | 455300005340/ASTM E831 TMA, 5 °C/min |
| Temperature Rating | -40 to 121 °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. 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.
5. Clean up uncured resin with suitable organic solvent such as MEK, acetone or other organic solvent.

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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.