

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

DESCRIPTION:

Resinlab EP691F Clear is a two-part electronic grade epoxy encapsulant designed for medium to large castings. It cures at room temperature to a tough, rigid polymer. It offers good wetting and adhesion to most surfaces and is free flowing to fill voids and release trapped air. EP691F Clear will have good resistance to water, acids, bases and most organic solvents. The mix ratio of this product is critical for optimal physical and electrical properties and should be measured by weight. It is comprised of raw materials listed in the Code of Federal Regulations Title 21:175.300 (Resinous and polymeric coatings)¹.

EP691F Clear will reach full cure at room temperature within 24-48 hours. Cure time can be accelerated by the application of heat. Times and temperatures from 2 hours at 65 °C to 1 hour at 100 °C are typical for small castings less than 50 grams.

TYPICAL PROPERTIES:

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

Property:	Value:	Test Method or Source:
Color	Clear	Visual
Mix Ratio	Part A to Part B	Calculated
By weight	3.13 to 1	
By volume	2.55 to 1	
Cure Schedule	2 hours @ 65 °C 1 hour @100 °C	
Viscosity – Part A	14,000 cps @1/s	Rheometer parallel plate 25mm@1/s
Viscosity – Part B	10 cps @1/s	455300006291
Viscosity - Mixed	700 cps @1/s	
Specific Gravity – Part A	1.16	Calculated
Specific Gravity – Part B	0.95	
Specific Gravity - Mixed	1.10	
Pot Life, defined as the time it takes for initial mixed viscosity to double	2 hours	Rheometer parallel plate 25mm@1/s 455300006291
Gel Time	> 12 hours/100cc sample	455300005339/Gardco Hot Pot Gel Timer
Glass Transition Temperature/Tg	82 °C	453560822409 by DSC
Hardness	80 Shore D	455300006287/ASTM D2240
Water Absorption	0.06% after 24 hours	457561824543/ASTM D570
Tensile Properties:		4535601224470/ASTM D638
Strength	8,300 psi	
Elongation	4.5%	
Modulus	335,000 psi	
Lap Shear Strength		4535601224468/ASTM D1002
0.010" bond line Al to A	2,000 psi	
Compressive Properties:		4535601224467/ASTM D695
Yield Strength	11,800 psi	
Compressive Strength	34,000 psi	
Modulus	157,000 psi	
Flame Resistance	Passes Resinlab testing with HB rating at 6.0 mm thickness. Not UL Certified.	UL94

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Surface Resistivity	3.13 x 10 ¹⁵ ohm/sq (@ 38.3 %RH)	455300006612/ASTM D257
Volume Resistivity	3.16 x 10 ¹⁶ ohm-cm (@ 23.1 °C)	
Dielectric Constant / Dissipation Factor		455300006513/ASTM D150
@ 100 Hz	3.2, 0.008	
@ 100 kHz	3.0, 0.03	
Dielectric Strength	550 V/mil*	ASTM D149 Method A, immersed in ASTM D3487 Type II Oil
Coefficient of Thermal Expansion by TMA	44 ppm/ °C below Tg 222 ppm/ °C above Tg	455300005340/ASTM E831 TMA, 5 °C/min
Relative Thermal Index (RTI)	90 °C **	UL746B, Table 7.1 Generic Value Based on Composition
Operating Temperature Range	-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.
5. 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
6 months DOP at -40 °C as a one-part premixed and frozen
Specialty packaging may be less.

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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.

¹The FDA does not approve products for direct or indirect food contact. EP691F Clear is comprised solely of materials listed under these regulations and can be “used in accordance with” or “used in compliance with CFR Title 21 175.300”. It is the responsibility of the end user to determine if this conformance is appropriate to the final product’s end uses. The specific requirements of an application for food, drug or potable water are detailed by the FDA, USDA (food plants) or NSF (water).