TECHNICAL DATA SHEET

EP11HT Gray

Revision date: 5/17/2024

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

DESCRIPTION:

ResinLab® EP11HT Gray is a two-part filled epoxy adhesive formulated to bond metals and plastics. It cures at room temperature to a tough, semi-rigid material. *EP11HT Gray* has good wetting to most surfaces and will resist running and sagging due to its thixotropy. When cured this product can provide very good impact and vibration resistance. It has resistance to water, salt spray, inorganic acids and bases and most organic solvents. When used at a 1A to 2B ratio, this system has shown excellent ability to withstand cryogenic temperatures (-196 °C – Liquid Nitrogen) exposure. Bonded specimens were tested by cooling down to -196 °C for 5 to 10 minutes and then returning to room temperature; after this extreme thermal cycling, the *EP11HT Gray* adhesive maintained original bond strength without cracking.

EP11HT Gray was formulated to a 1A:1B by volume mix ratio for use in side by side dispensing cartridges and meter/mix and dispense equipment. It reaches full cure at room temperature within 24-48 hours. Cure time can be accelerated by the application of heat. Times and temperatures from 1 hour at 65 °C or 20 minutes at 100 °C are typical for most applications. Time to heat substrate must be taken into account. Cooler temperatures will also extend work time and increase cure times.

TYPICAL PROPERTIES:

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

Property:	*Value:*	*Test Method or Source:*
Color	Gray	Visual
Mix Ratio	Part A to Part B	Calculated
Mix Ratio by weight	0.98 to 1	
Mix Ratio by volume	1 to 1	
Cure Schedule	24-48 hrs @ 25 °C 1 hr @ 65 °C 20 min @ 100 °C	
Viscosity - Part A	515,000 cP	TA HR20 Rheometer 25mm parallel plate @ 1/s DCV6100723
Viscosity - Part B	235,000 cP	
Viscosity - Mixed	375,000 cP (estimated)	
Specific Gravity - Part A	1.27	Calculated
Specific Gravity - Part B	1.29	
Specific Gravity - Mixed	1.28	
Pot Life defined as the time it takes for initial mixed viscosity to double	3 hours	Rheometer parallel plate 25mm @1/s 455300006291
Gel Time	3.5 hours (50g mass)	Visual, Observed cup and stick
Peak Exotherm	75 °C for 50 mL sample	455300005593 by Type K thermocouple
Hardness	80 Shore D	455300006287/ASTM D2240
Glass Transition Temperature/Tg	70 °C	453560822409 by DSC
Water Absorption	0.14 %	24 hr immersion 457561824543/ASTM D570

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Property:	*Value:*		*Test Method or Source:*
Tensile Properties:			4535601224470/ASTM D638
Strength	4,900 psi		
Elongation	1 – 2 %		
Modulus	378,000 psi		
Compressive Properties:			4535601224467/ASTM D695
Yield Strength	14,500 psi		
Ultimate Strength	15,900 psi		
Modulus	154,000 psi		
Flame Resistance **Tested at ResinLab, not UL Certified**	Passes with HB Rating @ 6.0 mm		45376013225560/UL94HB
Thermal Conductivity by Transient Plane Heat Source (TPS)	0.28 W/m.K		Thermtest TPS Hot Disk ISO 22007-2 45376013225604
Electrical Resistivity:			455300006612/ASTM D257 @ 20 °C @ 47 %RH
Volume	8.68 x 10^{14} ohm-cm		
Surface	4.03 x 10^{15} ohm/sq		
Dielectric Constant & Dissipation Factor:	ε’	tan δ	455300006513/ASTM D150
@ 100 Hz	3.1	0.003	
@ 100 kHz	3.0	0.02	
AC Dielectric Strength	17 kV/mm *		DCV6101609; ASTM D149 Method A, immersed in ASTM D3487 Type II Oil
Coefficient of Thermal Expansion by TMA:			455300005340/ASTM E831 TMA, 5 °C/min
below Tg	70 ppm/°C		
above Tg	191 ppm/°C		
Operating Temperature Range	-40 to 150 °C**		
Relative Thermal Index (RTI)	90 °C		UL746B, Table 7.1 Generic Value Based on Composition

* 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.

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Additional Performance Data – Lap Shear Adhesion, 4535601224468/ASTM D1002:				
Substrate Type	**Strength**	**Test Temperature**	**Cure Schedule**	**Bond Line Thickness**
Al to Al	2,100 psi	-51 °C		0.010 "
Al to Al	3,300 psi	25 °C		0.010 "
Al to Al	2,700 psi	49 °C		0.010 "
Al to Al	1,900 psi	82 °C		0.010 "
Al to Al	1,100 psi	93 °C		0.010 "

INSTRUCTIONS:

1. Bring to room temperature prior to use.
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: stir until homogeneous 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. Clean up uncured resin with suitable organic solvent such as MEK or acetone.
5. Allow to cure undisturbed until product is fully gelled or tack-free to the touch.

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.