



# ES6296

## Lightweight Tough High Temperature Epoxy Adhesive

### DESCRIPTION

ES6296 is a two component epoxy adhesive intended for use in bonding composite parts and structural assemblies. ES6296 is a very tough adhesive that works well in applications where severe stresses and vibration are involved. It is not brittle when cured, and has very good resistance to peel forces. The mixed material has very good thixotropy, and fills gaps in uneven bond lines without sagging or run out during cure. ES6296 has a high glass transition temperature (Tg), so it is very well suited to applications where good performance at higher temperatures is required.

### PRODUCT SPECIFICATIONS

	ES6296 Part A	ES6296 Part B	ASTM Method
Color	White	Black	Visual
Viscosity, @ 77°F, centipoise	Pourable	Thick Paste	D2392
Specific Gravity, gms./cc	1.092	1.05	D1475
Mix Ratio	100 : 23 By Weight, or 5 to 1 By Volume		PTM&W
Pot Life, 4 fl.oz. Mass @ 77°F	50 - 60 minutes		D2471


### DIRECTIONS FOR USE

**PREPARATION:** When using epoxy adhesives, all surfaces to be bonded or patched must be free of dirt, oil and grease. Sanding or roughening the area to be bonded increases the surface area and enhances the bond. Surface treatments and preparation procedures are available that improve the adhesion to specific surfaces. Check with our Technical Services Department for information regarding your particular application.

**MIXING:** Measure out the correct amount of resin and hardener, combine, and mix thoroughly until a uniform color and consistency is reached. Mix for at least 1 to 2 minutes, scraping the sides and bottom of the container to avoid leaving unmixed material that will cause soft spots in the cured material.

**APPLICATION and CURING:** Apply mixed material to the properly prepared surfaces of the parts to be bonded. If necessary, place assembly in a jig or other device to prevent movement during initial curing time. ES6296 will cure at room temperature, but, a heat cure is required to achieve the full heat resistance and stability the material is capable of. Therefore, ES6296 should be heat cured to achieve full cure and maximum properties. The data listed in this bulletin were obtained with one of the following cure cycles: 1. Overnight at Room Temperature (77°F minimum), plus 6 hours at 210°F, or 2. Overnight at Room Temperature (77°F minimum), plus 6 hours at 230°F. Testing is continuing to establish optimum cure times at various temperatures for maximum properties.

**TYPICAL MECHANICAL PROPERTIES**

		ES6296 A / B		ASTM Method
Mix Ratio,	By Weight By Volume	100 : 23 By Weight, or 5 to 1 By Volume		PTM&W
Color		Gray		Visual
Mixed Viscosity, centipoise		Non Sag Paste		D2393
Cured Hardness, Shore D		85 Shore D		D2240
Specific Gravity, grams, cc		1.084		D1475
Thermal Coefficient of Expansion, Range: 120°F to 212°F 300°F to 400°F		4.01 x 10 <sup>-5</sup> in./in./ °F 8.57 x 10 <sup>-5</sup> in./in./ °F		D696
 Cure Schedule		Overnight @ Room Temperature, plus		
		6 Hours @ 210°F	6 Hours @ 230°F	
Compressive Strength, psi		12,302 psi	14,272 psi	D695
Compressive modulus, psi		350,554 psi	528,841 psi	
Tensile Lap Shear, Epoxy/Glass Laminate Substrate, @ 77°F, 15 mil Bond Line 30 mil Bond Line			4,042 psi	D3165
			3,218 psi	
Glass Transition Temp., T <sub>g</sub> , DMA		Onset (E') 247°F, T <sub>g</sub> , Peak (T <sub>g</sub> ) 274°F	Onset (E') 262°F T <sub>g</sub> , Peak (T <sub>g</sub> ) 289°F	D7028

**SAFETY and HANDLING**

PTM&W epoxy products are made from raw materials carefully chosen to minimize or even eliminate toxic chemicals, and therefore offer the user high performance products with minimum hazard potential when properly used. Generally, the PTM&W epoxy resins and hardeners will present no handling problems if users exercise care to protect the skin and eyes, and if good ventilation is provided in the work areas. However, breathing of mist or vapors may cause allergenic respiratory reaction, especially in highly sensitive individuals. As such, avoid contact with eyes and skin, and avoid breathing vapors. Wear protective rubber apron, clothing, nitrile rubber gloves, face shield or other items as required to prevent contact with the skin. In case of skin contact, immediately wash with soap and water, followed by a rinse of the area with vinegar, and then a further wash with soap and water. The vinegar will neutralize the hardener and lessen the chances of long term effects. Use goggles, a face shield, safety glasses or other items as required to prevent contact with the eyes. If material gets into the eyes, immediately flush with water for at least 15 minutes and call a physician. Generally, keep the work area as uncluttered and clean as possible, and clean up any minor spills immediately to prevent accidental skin contact at a later time. Keep tools clean and properly stored. Dispose of trash and empty containers properly. Do not use any of these types of products until Material Safety Data Sheets have been read and understood.

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