PT2712
Low Viscosity System for Tough Parts & Structures

DESCRIPTION

PT2712 is a low viscosity epoxy system designed for the fabrication of parts and structures by the resin infusion method. This system flows extremely well, and produces dense, void-free laminates routinely. The cured properties of this system are very high, so it produces items with good strength and toughness with excellent long-term stability.

Three hardeners are available for use with this resin, which provide a range of working times. The hardeners have gel times of approximately 1 hour, 2 hours and 3 hours, so, by proper selection between the three, it is possible to easily infuse any size structure. The three hardeners are identical except for reaction time, so no matter which hardener is chosen, the user can expect the same high performance properties. The mixed viscosity with all three hardeners is just over 300 centipoise, so the material flows very well, even in thin walled areas. It penetrates heavy fabric sections and wets out quickly for further ease of production.

PRODUCT SPECIFICATIONS

	PT2712-A	Part B	Part B1	Part B2	Part B3	ASTM Method
Color	Amber Clear	Amber				Visual
Viscosity, centipoise	1000 cps	25 cps			60 cps	D2392
Specific Gravity, gms./cc	1.10	.97			.99	D1475
Mix Ratio, By Weight By Volume		100 : 22 By Weight 4 to 1 By Volume				PTM&W
Pot Life, 4 fl. Oz. Mass @ 77°F		~ 1 Hour (70 min.)	~ 2 Hours (122 min.)	~ 3 Hours (175 min.)	40 minutes	D2471

HANDLING and CURING

The four hardeners for PT2712 will cure completely at room temperature, if required. In the case of smaller parts and structures made with the faster hardeners B and B3, the material will gel hard overnight at normal ambient temperatures. At this point in the cure, the bag and ancillary infusion materials can be removed from the laminate and the part can be sanded or trimmed as required. Full cure with these 2 hardeners will be achieved in 4 to 6 days at normal room temperature. Warmer summer temperatures will shorten this cure and a cooler environment will increase cure time.

When using Part B1 or B2, for larger structures, longer time must be given at all cure stages to allow proper curing with this slower reacting hardener. Well over 24 hours at room temperature is required before the structure can be removed and sanded, with the exact time depending upon laminate size and shop environment. Tests with standard laminate samples made with Part B2 hardener have shown that full cured properties are reached in 10 days at 75°F for example.

In all instances, a heat cure will shorten the curing time of PT2712. In situations where the laminate can be placed in an oven after a room temperature gel, curing times of 8 to 10 hours at 180°F or 14 to 18 hours at 150°F will provide 90% of full cured properties. When an oven has not been available or practical, due to the size of the structure, for example, structures have been tented with plastic or tarps and then lights or space heaters have been used as the heat source for curing. Also, plywood boxes have been fabricated to enclose the structure for curing in this manner. Experimentation will determine the best method to use for the individual structure and shop conditions.

PACKAGING WEIGHTS

	Gallon Kit	Pail Kit	Drum Kit
PT2712 Part A	9 lb.	36 lb.	500 lb.
Part B, B1, B2 or B3	2 lb.	8 lb.	111 lb. (3 @ 37 lb.)

TYPICAL MECHANICAL PROPERTIES

		PT2712 A / B *1	ASTM Method
Mix Ratio, By Weight By Volume		100 : 22 By Weight (All 4 Hardeners) 4 to 1 By Volume (All 4 Hardeners)	PTM&W
Pot Life, @ 77°F		Part B - 70 min.; Part B1 - 122 min.; Part B2 - 175 min.; Part B3 - 40 min.	D2471
Color		Light Amber	Visual
Mixed Viscosity, centipoise		320 cps.	D2393
Cured Hardness, Shore D		86 Shore D	D2240
Specific Gravity, grams, cc		1.08	D1475
Tensile Strength, psi	Cast Bar	10,960 psi	D638
Elongation, % at Yield	Cast Bar	6.3 %	
Tensile modulus, psi	Cast Bar	486,610 psi	
Tensile Strength, psi	Laminate*2	41,415 psi	D638
Elongation, % at Break	Laminate*2	2.54 %	
Tensile modulus, psi	Laminate*2	2,792,062 psi	
Flexural Strength, psi	Cast Bar	18,942 psi	D790
Flexural Modulus, psi	Cast Bar	528,460 psi	
Flexural Strength, psi	Laminate*2	54,683 psi	D790
Flexural Modulus, psi	Laminate*2	2,876,867 psi	
Compressive Strength, psi		15,930 psi	D695
Compressive Modulus, psi		491,503 psi	
Izod Impact Strength, ft-lbs / in	Method A	1.093	D256
Glass Transition Temperature, DMA	Tg Onset (E') Tg Peak	161°F 204°F	D4065
Thermal Coefficient of Expansion, Range: 40°C to 60°C		5.42 x 10^{-5} in./in. °F	D696

*1: The 4 Hardeners for PT2712 are Functionally Identical Except for Reaction Time, so Cured Properties are The Same for All.

*2: Tensile and Flexural Properties were Determined with a 1/8 inch Laminate Style 7500 Boat & Tooling Fiberglass Cloth, Resin Content of 40%.

SAFETY and HANDLING

PTM&W epoxy products are made from raw materials caerfully 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, all epoxy resins and hardeners can be irritating to the skin, and prolonged contact may result in sensitization; and 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, 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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