



# PT4770

## Graphite Filled High Temperature Casting System

### DESCRIPTION

PT4770 is a graphite filled high temperature casting resin designed for use in fabricating tooling and components that require good heat resistance in service. PT4770 is capable of operating at temperatures in excess of 400°F with good performance. PT4770 has very good handling characteristics, with a mixed viscosity that allows easy pouring and good reproduction of surface details. The specially selected graphite fillers provide easy machining, good compressive strength, and, most importantly, aid in matching the coefficient of expansion of other composite components. PT4770 is an excellent choice for high temperature applications where toughness, good wear characteristics and dimensional stability are required.

The two high temperature hardeners listed herein for use with PT4770 resin provide a choice of gel times to allow the making of small or large items with minimum shrinkage and stress build-up in the finished casting. PT4770 Part B provides a working time of one hour, which is sufficient for the casting of small to medium shapes, and PT4770 Part B1 has a working time of almost three hours, which is useful for larger castings.

There are no restricted or regulated raw materials used in these high temperature products. PT4770 resin does not contain vinylcyclohexane diepoxide (VCHD), or other hazardous or potentially restricted diluents. The Parts B of this system do not contain methylene dianiline (MDA) or other potentially harmful aniline derivatives. They are non-staining and will not crystallize in normal shipping and storage conditions.

### PRODUCT SPECIFICATIONS

	PT4770 Part A	PT4770 Part B	PT4770 Part B1	ASTM Method
Color	Black	Amber	Amber	Visual
Viscosity, @77°F, centipoise	120,000 cps	1,650 cps	70 cps	D2392
Specific Gravity, gms./cc	1.33	1.09	0.99	D1475
Mix Ratio	----	1 hour	2.5 - 3 hours	PTM&W
Pot Life, 4 fl.oz. Mass @ 77°F	----	100 : 12	100 : 15	D2471

### HANDLING and CURING

When using PT4770 Part B, the casting will gel hard in 18 to 24 hours at 77°F. In lower temperature service, non-critical applications, the system can usually achieve its full cure in service. However, for maximum stability, an oven post cure is recommended, and is mandatory in applications where continuous service is over 250°F. When using PT4770 Part B1, under normal conditions the system will gel to a hard demoldable state in 24 to 36 hours. In colder shop environments, or unusual conditions, the user should check closely to insure that the resin has fully gelled before the casting is post cured.

Hardener	Initial R.T. Cure	Post Cure Schedule
PT4770 Part B	Gel 18 to 24 hr. @ 77°F	Post Cure for 3 hours ea. @ 150°F, 250°F and 300°F
PT4770 Part B1	Gel at least 24 hr. @ 77°F	Post Cure for 3 hours ea. @ 150°F, 200°F, 275°F and 325°F
<b>NOTE: If the expected service temperature is to be higher than the final cure temperature listed, then an additional 2 to 3 hours at 25°F above the expected service temperature is recommended.</b>		

## TYPICAL MECHANICAL PROPERTIES

	PT4770 A/B	PT4770 A/B1	ASTM Method
Mix Ratio, By Weight	100 : 12	100 : 15	PTM&W
Color	Black	Black	Visual
Mixed Viscosity, @77°F, centipoise	28,000 cps	13,400 cps	D2393
Pot Life, 4 fl. Oz. Mass, @77°F	1 hour	2.5 - 3 hours	D2471
Cured Hardness, Shore D	89 Shore D	89 Shore D	D2240
Shrinkage, inch/inch, Mold # 1, .053 Gallon Mold # 2, .344 Gallon	.0033 in. / in. ---	.0039 in. / in. .0054 in. / in.	D2566
Specific Gravity, grams, cc	1.38	1.35	D1475
Density, lb./cu. Inch lb. / gallon	.0499 11.5	.0488 11.3	D792
Specific Volume, cu. in./lb.	20.0	20.5	
Tensile Strength, psi	7,690 psi	7,180 psi	D638
Elongation at Break, %	1.54 %	1.53 %	
Tensile modulus, psi	6.58 x 10 <sup>5</sup> psi	6.29 x 10 <sup>5</sup> psi	
Flexural Strength, psi	12,326 psi	11,582 psi	D790
Flexural Modulus, psi	6.61 x 10 <sup>5</sup> psi	6.39 x 10 <sup>5</sup> psi	
Compressive Strength, psi	20,870 psi	20,490 psi	D695
Glass Transition Temperature, DMA: T <sub>g</sub> , Peak, TMA	310°F	318°F	D3386
Coefficient of Thermal Expansion, Range 50°C to 100°C	2.56 x 10 <sup>-5</sup> in. / in. / °F	2.57 x 10 <sup>-5</sup> in. / in. / °F	D696

## PACKAGING WEIGHTS

	Gallon Kit	Pail Kit	Drum Kit
PT4770 Part A	11 lb.	55 lb.	550 lb.
PT4770 Part B	1.34 lb.	6.6 lb.	66 lb.
PT4770 Part B1	1.66 lb.	8.25 lb.	84 lb.

## 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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