



PT8909 TOUGH, HEAT RESISTANT URETHANE for PROTOTYPE and PRODUCTION PARTS

DESCRIPTION

PT8909 is a low viscosity, modified polyurethane system designed for machine dispensing applications for the fast, efficient production of tough, durable castings and parts. It has a low mixed viscosity which allows easy mold filling into thin sections with low pressure. It develops strength very quickly, and allows fast demold times for more cycles per day. The cured material is very tough and can be demolded without fear of breakage. It is not brittle in thin sections! The heat resistance of PT8909 is very good. It has a high heat distortion temperature - even with only a room temperature cure. A much broader range of part types can be considered with PT8909, as it will withstand exposure to heat better than other materials of this type. PT8909 is a tougher, more versatile product than previously available materials for this application.

The PT8909 Part B1 hardener provides a longer working life system that is designed for casting thicker wall sections and larger parts. The longer pot life of this system allows these larger castings to be made with minimum shrinkage in the finished part. Since they have the same mix ratio, the PT8909 standard Part B and the B1 hardener can be blended for intermediate working and cure times to suit the sizes of different parts.

Among the advantages that PT8909 offers the user are:

- **Low Mixed Viscosity - Excellent Flow for Low Pressure Molding**
 - **Faster Demold Time - Under 10 Minutes - Faster Production Rates!**
 - **Toughness Developed Quickly for Demolding Without Breakage**
 - **Low Cured Shrinkage**
 - **Extremely Tough Cured Properties - Excellent in Thin Sections**
 - **Very High Heat Resistance - Glass Transition Temperature is 326°F!**
 - **Easy to Color with Standard Dyes and Pigments**

PRODUCT SPECIFICATIONS

	PT8909 Part A	PT8909 Part B	PT8909 Part B1	Test Method
Color	Tan	Light Amber	Tan	Visual
Viscosity, centipoise, @ 77°F	200 cps	1800 cps	2200	ASTM D2393
Specific Gravity	1.24	1.02	1.05	ASTM D1475
Pot Life, 4 fluid oz. mass, @ 77°F		45 - 55 seconds	10 minutes	ASTM D2471
Mixing Ratio	80 A : 100 B By Weight		67 A : 100 B By Volume	PTM&W

HANDLING and CURING

PT8909 is capable of curing at room temperature, however, it is usually cured at elevated temperatures for faster production rates and better cured properties. The system develops toughness rapidly in the mold, so it can be demolded without breakage quickly - as soon as 10 minutes for some part configurations. The part is then allowed to cure, either at ambient temperatures or with heat. In all curing situations, parts should be allowed to cure with a minimum of applied stress, to prevent distortion. If the part has a flat side, or surface upon which it can rest during cure, it is usually not necessary to utilize holding fixtures for room temperature curing. If the part design is such that there is no good base or flat plane on which it can sit, then some sort of fixture is probably a good idea.

Full properties are developed with a room temperature cure in 6 to 7 days, though for many applications, sufficient cure for service is achieved sooner than this. Part size, shape and thickness all influence the cure rate, so evaluation is necessary to determine the exact amount of room temperature cure necessary. For applications that require the maximum cured properties, a heat cure is necessary to achieve the best results. A heat cure is mandatory for applications where parts will be subjected to elevated temperatures in service. After the part is demolded at room temperature, it should be allowed to stabilize for a period of time, then oven cured in a supported condition. Recommended oven cure cycles are: [A] Overnight (14 to 16 hours) at 175°F, or, [B] 4 hours at 175°F (80°C), plus 4 hours at 212°F (100°C).

The PT8909 Part B1 hardener cures very similar to the Part B hardener, with slightly longer demold times, due to the longer pot life of the system. Inasmuch as the B1 hardener is intended for larger, thicker parts, the heavier cross sections will somewhat offset the longer cure time of the B1 hardener, giving cure cycles very much like the Part B hardener.

TYPICAL MECHANICAL PROPERTIES

	PT8909 A with Part B		w- Part B1	Test Method
	Room Temp. Cure (7 Days @ R.T.)	Heat Cure (14 Hrs. @ 175°F)	Heat Cure (14 Hrs. @ 175°F)	
Mix Ratio Part A : Part B	80 : 100 By Weight		67 : 100 By Volume	PTM&W
Color	Buff			Visual
Pot Life, 4 fluid ounce mass, @ 77°F	45 - 55 seconds		10 minutes	ASTM D2471
Cured Hardness, Shore D	78 D	79 D	84 D	ASTM D2240
Linear Shrinkage, in./in. Mold #0 (.5" radius x 10"; .017 Gal) Mold #1 (.875" radius x 10"; .053 Gal)	.0090 .0129	.0099 .0144		ASTM D2566
Cured Specific Gravity, grams/cc	1.11		1.13	ASTM D1475
Tensile Strength, psi	5120 psi	5805 psi	7,550 psi	ASTM D638
Elongation, %	7.6%	8.1%	3.6 %	ASTM D638
Tensile Modulus, psi	159,660 psi	159,359 psi	302,250 psi	ASTM D638
Izod Impact, foot-pounds per inch	1.10	1.10	1.15	ASTM D256
Flexural Strength, psi	7700 psi	8300 psi	12,865 psi	ASTM D790
Flexural Modulus, psi	185,712 psi	196,834 psi	339,024 psi	ASTM D790
Compressive Strength, psi	22,400 psi	25,180 psi	27,300 psi	ASTM D695
Glass Transition Temperature, T _g	304°F	326°F	245°F	DMA
Heat Deflection Temperature, @ 66 psi @ 264 psi	258°F 232°F	292°F 260°F		ASTM D648
Coefficient of Thermal Expansion Range: 30°C to 60°C	7.02 x 10 ⁻⁵ in./in./°F	6.93 x 10 ⁻⁵ in./in./°F		ASTM D696

SPECIAL INFORMATION

As mentioned, the PT8909 hardeners Part B and Part B1 can be blended to provide intermediate working times for different sizes of parts. The chart below gives the pot life for various blends of PT8909 B and B1 hardeners.

% PT8909 B	100	75	50	25	20	15	10	5	—
% PT8909 B1	—	25	50	75	80	85	90	95	100
Pot Life @77°F	45 sec.	1 min.	1.5 min.	3 min.	4 min. 10 sec.	5.5 min.	7 min.	8.5 min.	10 min.

PACKAGING WEIGHTS

	Gallon Kit	Pail Kit	Drum Kit
PT8909 Part A	6.4 lb.	32 lb.	360 lb.
PT8909 Part B or B1	8 lb.	40 lb.	450 lb.
Kit	14.4 lb.	72 lb.	810 lb.

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