



PT8925 HARD TRANSPARENT URETHANE

DESCRIPTION

PT8925 is a transparent, water-white urethane casting system that is useful for the production of tough, impact resistant clear parts. Three different hardeners that have different gel times are available for use with this resin, for either thin walled parts or mass castings. The PT8925 B1 and PT8925 B2 hardeners are intended for the production of small parts or those with thinner walls. PT8925 B1 has a 90 second gel time, and PT8925 B2 has a 10-12 minute gel time. The B1 and B2 hardeners can be blended to provide intermediate gel times for optimum results in different wall thicknesses and part sizes. PT8925 Part B3 has a 45 to 50 minute gel time, and is suitable for the production of large parts with heavy cross sections. The slower setting time of hardener B3 provides lower shrinkage in thicker sections, to maintain dimensional stability and good clarity in the finished parts. PT8925 B3 is the usual choice for hand mixing and pouring parts, as its longer gel time allows sufficient time to thoroughly mix, deair and pour by hand. PT8925 B2 can be hand mixed and poured when smaller parts are involved. With either of these three hardeners, parts made with PT8925 exhibit an excellent water-white appearance with no distortion. The cured material is hard, tough and very durable. It can be polished to a gloss finish with ease. PT8925 has higher heat resistance than is normally achieved with clear urethanes, so it is able to operate in more harsh environments than previous materials of this type. As urethanes typically exhibit less severe attack on silicone molds, longer life can be expected with the mold than with epoxy casting systems, for lower overall mold costs.

Typical applications for PT8925 include:

- **High Volume, Machine Dispensed, Heat Cured Production Parts**
 - **Hand Poured, Room Temperature Cured Parts**
 - **Preproduction Prototypes**
 - **Thin Wall Clear Parts with Good Toughness**
 - **Prototype Die Segments To Observe Material Flow**
 - **Transparent Colored Parts, with The Addition of Dyes**

PRODUCT SPECIFICATIONS

	PT8925 A	PT8925 B1	PT8925 B2	PT8925 B3	ASTM Method
Color	Clear	Clear	Clear	Clear	Visual
Viscosity, @ 77°F, centipoise	400 cps	1440 cps	1440 cps	1440 cps	D2392
Specific Gravity, gms./cc	1.11	1.07	1.07	1.07	D1475
Pot Life, 4 fl. Oz. Mass @ 77°F		90 seconds	10 - 12 min.	45 - 50 min.	PTM&W
Mixing Ratio		100 : 60 By Weight;		1.6 to 1 By Volume	D2471

HANDLING and CURING

When the PT8925 Part A is mixed together with any of the Part B hardeners, they form an opaque white liquid. As various components begin to react, the mixture begins to change to a water-clear liquid. This change usually takes approximately one-half of the pot life. When mixing and pouring parts by hand, certain steps should be taken to insure clear, void free cast parts. The PT8925 resin and hardener should be mixed thoroughly for the first five minutes after combining. A complete mix is necessary to prevent streaks or mix lines in the finished casting. Wood and paper mixing gear should be avoided, as they might introduce contaminants and/or moisture into the mix, and ruin the casting. Even the smallest dirt and dust particles detract considerably from the appearance of a finished transparent casting. Use metal or plastic mixing apparatus and containers to minimize the chance of contaminants. It is best to degas PT8925 before the mixture clears, or the air bubbles become more difficult to remove. After degassing, the mixed PT8925 should be periodically stirred until the mixture clears, and then immediately poured into the mold. After the PT8925 is poured, it is advisable to vacuum the material in the mold, or, place the mold in a pressure chamber, if available.

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HANDLING and CURING, cont'd

PT8925 will cure completely at room temperature with hardener B1. When either hardeners B2 or B3 are used, the mixture should be heat cured for more realistic production rates. With hand cast parts, that have heavy cross sections, the material should be allowed to gel at room temperature before heat curing. In those cases, the parts should be allowed to cure at room temperature for 6 to 8 hours, after which they can be placed in an oven to complete the cure. Typical heat cure cycles for urethanes are 4 to 6 hours at 140°F to 165°F. When using hardener B1 and machine dispensing for production applications, in which the material is deaired when cast, the material can be injected into the mold, and then placed into an oven immediately for curing. The dispensing machine is sealed, so no contaminants will be introduced into the PT8925 before it enters the mold, and the material is deaired when dispensed, so there will not be any air voids in the part as it cures. The B1 hardener cross-links so quickly that the opaque white phase does not occur, and therefore the immediate heat cure is possible with no streaking, as might occur with hardeners B2 or B3. The typical urethane curing schedule can be used for guidelines, and an optimum heat cure can be arrived at by experimentation, determined by part volume and configuration, mold materials and construction, etc.

TYPICAL MECHANICAL PROPERTIES

	PT8925A w/ PT8925 B1, B2 or B3	ASTM Method
Color	Transparent, Water-White	Visual
Mixed Viscosity, @77°F, centipoise	1100 cps	D2393
Cured Hardness, Shore D	80 - 85D	D2440
Specific Gravity, grams / cc	1.14	D1475
Density, pounds/cubic inch	.0413 lb./cu. in.	D792
Specific Volume, cubic inches / pound	24.2 cu. in. / lb.	
Tensile Strength, psi	10,080 psi	D638
Elongation at Break, %	41 %	
Tensile Modulus, psi	69,720 psi	
Flexural Strength, psi	13,576 psi	D790
Flexural Modulus, psi	3.52 x 10 ⁵ psi	
Compressive Strength, psi	11,010 psi	D695
Compressive Modulus, psi	3.63 x 10 ⁵ psi	
Glass Transition Temperature (T _g)	166°F	TMA
Coefficient of Thermal Expansion, Range: 100°F to 150°F	4.94 x 10 ⁻⁵ inch/inch/°F	D696

SPECIAL INFORMATION

PT8925 hardeners B1 and B2 can be blended to provide a range of gel times from 90 seconds to 12 minutes. This is useful for "tailoring" the system to specific wall thicknesses and cross sections for optimum cure time and minimum shrinkage. The table below shows the effects on the gel time of various blends of these two hardeners.

% Hardener B1	100	75	50	25	20	15	10	5	0
% Hardener B2	0	25	50	75	80	85	90	95	100
Gel Time, minutes	1.5 min.	2 min.	3 min.	4.5 min.	5.5 min.	6.5 min.	7.5 min.	9 min.	11 min.

PACKAGING WEIGHTS

	Quart Kit	Gallon Kit	Pail Kit	Drum Kit
PT8925 A	1.7 lb.	7.5 lb.	45 lb.	440 lb.
PT8925 B1, B2 or B3	1 lb.	4.5 lb.	27 lb.	264 lb.
Kit	2.7 lb.	12 lb.	72 lb.	704 lb.

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