



# PAPA

## POLYAZELAIC POLYANHYDRIDE

### Description

Polyazelaic Polyanhydride (PAPA) is a light tan, wax-like solid with a melting point of 65°C. PAPA is soluble in liquid anhydrides and epoxy resins. The unique property of PAPA is that it provides a high degree of toughness when it is blended into liquid anhydride curing agents at levels of 10-20%. Low temperature impact resistance and thermal cycling resistance are greatly improved without significant lowering of the Tg or tear strength.

PAPA, when cured with epoxy resins, makes possible a one package system with room temperature stability of two months to over one year. In addition, solutions in ketones and aromatic solvents are achievable. Also possible are elongations from 5% to 100%, coupled with Tensile Strengths of 3,000 to 6,500 psi.

Higher elongations may be achieved by:

- a) Increasing or decreasing the quantity of PAPA
- b) Blending with dimer or trimer acids
- c) Decreasing the quantity of accelerator

Although such formulations pass 10 thermal shocks in the Navy "hex bar" test (MIL-I-16923C), the addition of fillers such as silica or alumina, further enhance the thermal shock properties.

Chemical Name: Polyazelaic Polyanhydride

Molecular Weight: 1200-1300

CAS Number: 26776-28-3

### Typical Applications for PAPA Cured Epoxy Resins

- Electrical Potting and Encapsulation Compounds / Powder Coatings
- One Package Adhesives
- Paper and Glass Laminates
- Prepreg Tapes

### **In blends with liquid anhydrides**

- Filament Wound Composites (superior toughness)
- Casting / Potting / Encapsulation Compounds

### Specifications

Appearance	Waxy Tan Solid
Melting Point	approx. 65°C
Boiling Point, 760 mmHg	260 °C
% Anhydride	35.0 Min.
% Free Acid	7.0 Max.



**Typical Formulation**

Bis A Epoxy Resin (EEW=185)	100
PAPA	65
AC-8	1
Melting Range, °C	40-80
Shelf Life at 25°C	1-2 Months
Gel Time at 140°C, minutes	50

**Properties**

Cure Schedule: 1 Hr. @ 140°C + 20 Hr. @ 150°C

Modulus of Elasticity	1.22 x 10 <sup>5</sup>
Hardness, Shore D	75
Tensile Strength, psi	5,155
Elongation %	14.9
Heat Deflection, 10 mil	39°C
Breakdown Voltage, Volts/Mil	267

Cure Schedule: 1 Hr. @ 140°C + 4 Hr. @ 150°C

Hardness, Shore D	65
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**ELECTRICAL PROPERTIES**

Temperature °C	Applied Voltage, AC	Volts per Mil Applied	% Power Factor
25	1800	15	3.2
25	7400	60	9.2
171	1800	15	22.4
171	7400	60	56.5
<b>Breakdown Voltage, Volts/Mil</b>			<b>267</b>

**Packaging:** It is packaged as a fused solid in 55 gallon, open-head metal drums containing 475 pounds net, or in 5 gallon metal pails containing 45 pounds net.

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