

PFCB Polymers

- ◆ **Solution & Melt Processable**
- ◆ **Tunable Refractive Index**
- ◆ **Tg from 120-350°C**
- ◆ **Amorphous & Transparent**
- ◆ **Catalyst & Condensate Free**
- ◆ **Excellent Thermal/Thermal Oxidative Stability**

Specifications

| Polymer | Condition or Property | Controlled Range |
|---|--|---|
| Thermoplastic or Thermoset Polymer (Solid or Solution) | Solid content (wt %) | 50 - 100 |
| | Solution viscosity (Pa·s, RMS) | 0.02 – 100,000 |
| | Number average molecular weight (M_n , GPC) | 1,000 - 50,000 |
| | Cure temperature (°C) / time (h) | 230 / 2 |
| | Single spin coat thickness (μm) | Up to 30 |
| | Patterning Technique | Micro-molding, RIE, O ₂ plasma |
| | Loss (dB/cm, 1550 nm) | < 0.25 |
| | Birefringence ($\eta_{TE} - \eta_{TM}$) | < 0.003 |
| | Refractive index (1550 nm) | 1.442 - 1.505 |
| | Thermal Decomposition Temperature (°C, TGA) | > 450 (Fully cured sample) |
| | Glass Transition Temperature (°C, DSC) | 110 - 350 |
| | dn/dT (1550 nm) | $-7 \times 10^{-5} \sim -1.5 \times 10^{-4}$ |
| | Typical solvents | Mesitylene, cyclopentanone, THF (others on request) |
| Cleaning solvents | Acetone, Hexane | |

Other Selected Properties

| Properties | Triphenyl Ethane PFCB Thermoset | Biphenyl PFCB Thermoplastic |
|-------------------------------------|---------------------------------|-----------------------------|
| Dielectric Constant (10 kHz) | 2.45 | 2.41 |
| Dissipation Factor (10 kHz) | 0.0004 | 0.0003 |
| % Water Absorption (24 hr) | 0.021 | 0.040 |
| Tensile Strength (psi) | 9,600 ± 203 | 7,300 ± 203 |
| Tensile Modulus (psi) | 329,000 ± 11,450 | 246,000 ± 11,460 |
| Flexural Strength (psi) | 10,700 ± 1800 | 13,400 ± 304 |
| Flexural Modulus (psi) | 336,400 ± 1,900 | 258,000 ± 12,385 |
| Percent Elongation (Break) | 4.1 | 12.5 |
| Limiting Oxygen Index (LOI) | 0.47 | 0.419 |
| Critical Surface Tension (dynes/cm) | 27.6 | - |

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