



HIGH PERFORMANCE PEEK POLYMERS

“Are your electronic components ready for the rigors of lead-free solder assembly?” Environmental legislation restricting the use of lead, along with commercial pressures are driving the industry to implement the use of lead-free materials in all electronic assemblies. End users have begun to specify components capable of surviving the increased reflow temperatures associated with lead-free solder systems. In contrast to traditional polymeric materials, high-temperature resistant VICTREX® PEEK polymer readily meets the demands of the most rigorous lead-free solder processes.

HIGHER PROCESS TEMPERATURE REQUIREMENTS

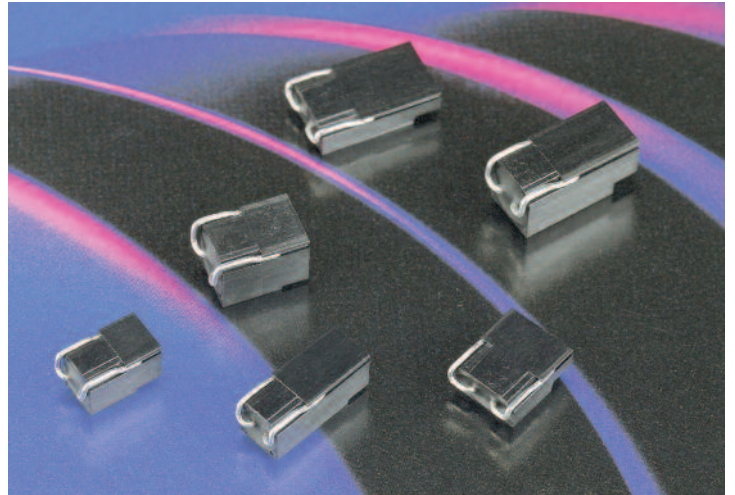
When compared to conventional lead solders which have a processing temperature of approximately 230°C (446°F), lead-free alternatives require extended exposure (preheating and reflow) at higher maximum temperatures which often exceed 260°C (500°F).

TRADITIONAL MATERIALS UNABLE TO WITHSTAND PROCESSING REQUIREMENTS

Because of these higher temperature requirements, many of the traditional polymeric materials used for electronic components fail. PBT, Nylon and PPS fail because they distort or melt under lead-free solder conditions. LCP has mechanical strength limitations and is on the edge of thermal performance.

KEY FEATURES OF VICTREX PEEK POLYMER

- **High Temperature Resistance** — has a heat resistance of up to 315°C (600°F). It maintains strength and dimensional stability at high temperatures which is especially important in sealed electronic components where internal pressure can deform parts.
- **Dimensional Stability** — maintains tight dimensional tolerance during the solder process. This ensures proper sealing for components such as relays/interposers.
- **Low Outgassing** — outgassing can contaminate and interfere with performance of electrical contacts. It can also raise internal pressures of sealed components during the solder process.



Under pressure to protect the environment, the semiconductor industry in Japan is taking measures to implement lead-free soldering technologies for mounting electronics parts and components. To meet these new requirements, Shoel Co. Ltd., of Tokyo selected VICTREX® PEEK polymer for the resin mold cases of its 'PetitCap' aluminum electrolytic capacitor.

- **Low Moisture Absorption** — important in lowering the total outgassing and maintaining tight dimensional control.
- **ECO Compliant (Green) FR Systems** — naturally flame retardant without the need for toxic additives (halogens, bromines, etc.).
- **Low Particle Generation** — important when components are sensitive to any particulate shedding which could impact component functionality and reliability.
- **Fully Recyclable** — unlike numerous epoxy systems, VICTREX PEEK polymer is fully recyclable.

For Lead-Free Soldering Processes

VICTREX PEEK Polymer Grades	
VICTREX PEEK 90G	unfilled, high flow PEEK
VICTREX PEEK 150G	unfilled, standard flow PEEK
VICTREX PEEK 90GL30	30% glass-reinforced high flow PEEK
VICTREX PEEK 150GL30	30% glass-reinforced standard flow PEEK
Custom Formulations	formulations containing unique fillers that address high strength or low CTE are available upon request.

In most cases, filled materials are required to increase heat distortion temperature (HDT), reduce coefficient of thermal expansion (CTE) and improve mechanical properties.

APPLICATION AREAS

- Signal Relays
- Capacitor Covers
- Battery Components
- Interposer Covers
- Connectors
- Telecom Coaxial Plugs

Material Comparison

	Tensile Strength psi (MPa)	Heat Deflection Temp. °C (°F)	Melting Temp. °C (°F)	Outgassing at 250°C (482°F) (ppm)	Water Absorption @ 24hrs (%)	Comments
VICTREX PEEK (GF*)	23,900 (165)	315 (599)	340 (644)	<5	0.11	VICTREX PEEK polymer meets the demands for the most rigorous lead-free solder processes.
LCP (GF)	21,800 (150)	250 (482)	310 (590)	<10	0.04	In some cases, material survives lead-free temperatures but has poor mechanical strength.
PPS (GF)	20,300 (140)	260 (500)	270 (518)	>40	0.02	Material will typically distort under solder temperatures.
PA66 (GF)	23,200 (160)	250 (482)	260 (500)	>40	1.60	Material will typically distort under solder temperatures.
PBT (GF)	17,500 (120)	200 (390)	220 (428)	>40	0.30	Material will typically distort under solder temperatures.

*GF=glass reinforced

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