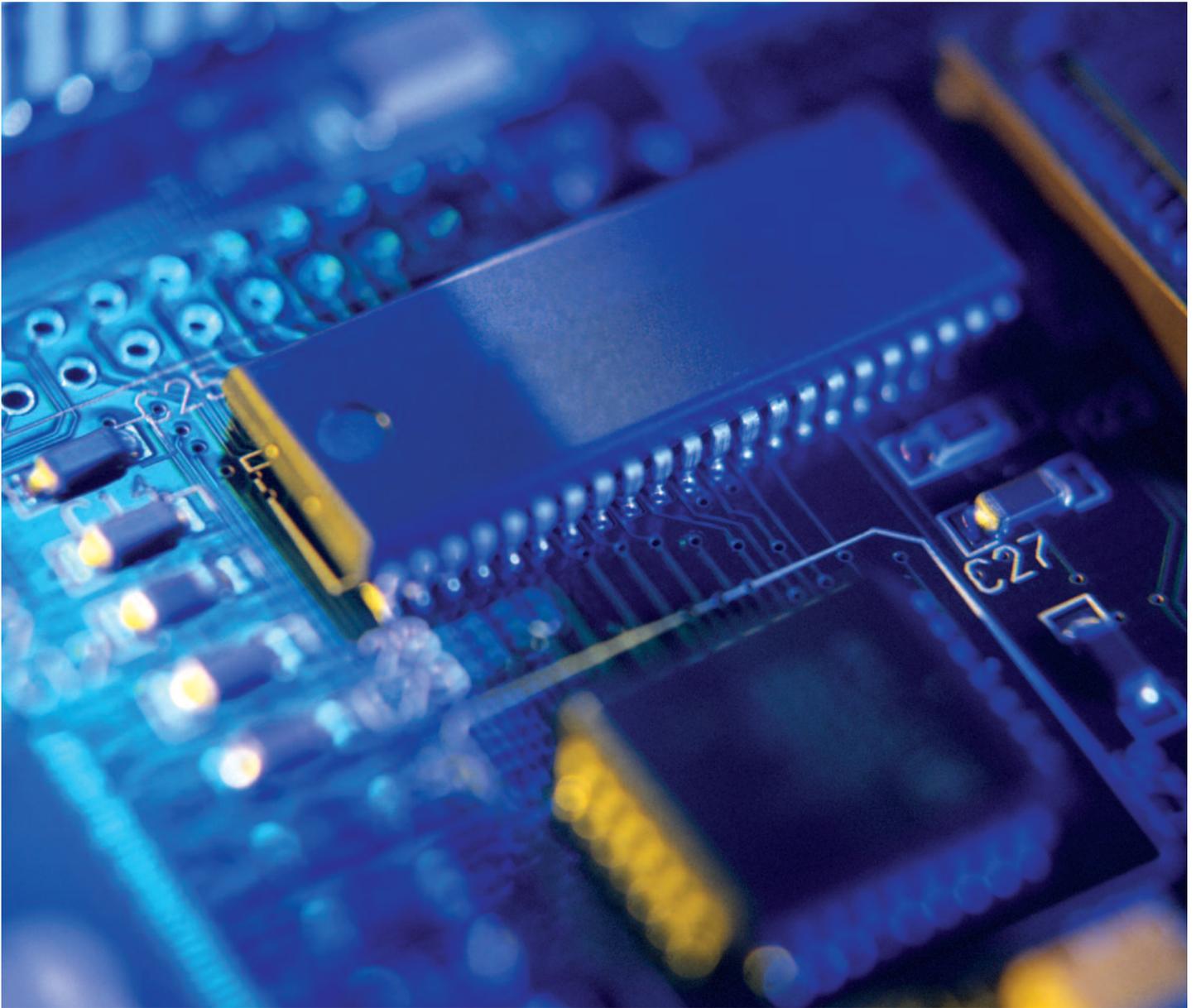




HIGH PERFORMANCE PEEK POLYMERS



For the Electronics Industry

Material of choice...

VICTREX® PEEK polymer offers a unique combination of properties that can greatly enhance the performance of electronic components.

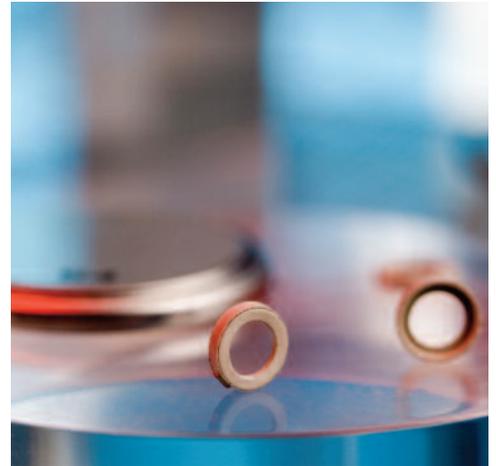
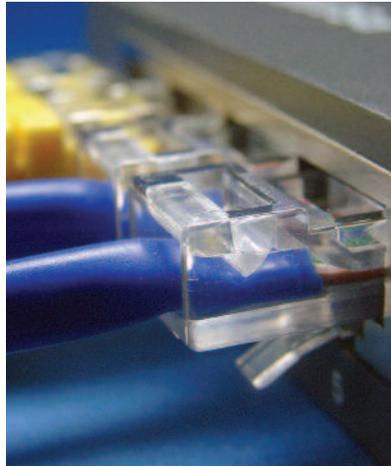
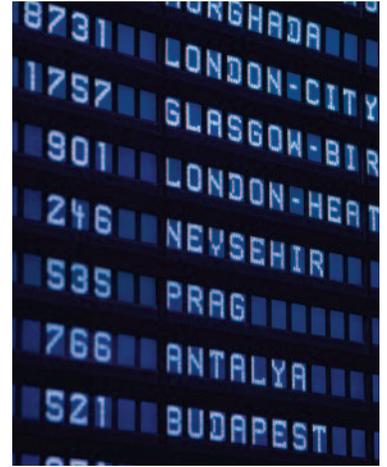
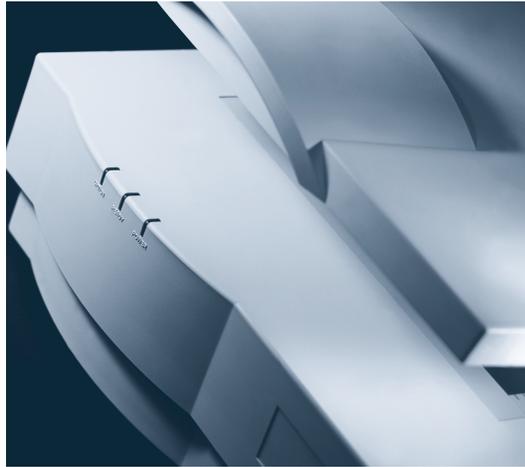
Victrex is an innovative world leader in high performance materials whose team of dedicated market development, sales, and technical support professionals has a long history — over 30 years — of working hand-in-hand with electronics customers around the world assisting them with new application development, together with product performance data and processing support.

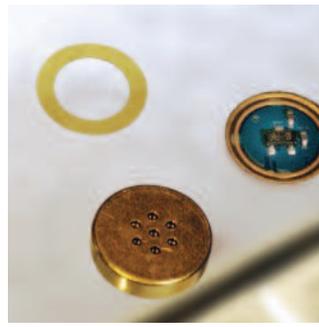
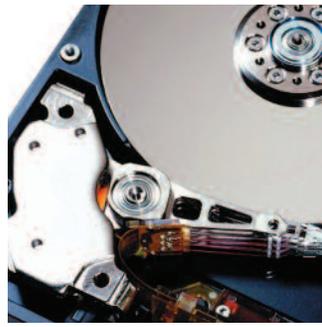
Material selection is critical to today's electronic components. Demands for higher performance, portability, wireless/high frequency, and longer life, as well as concerns about the environment, are all shaping the way electronic parts are designed. Because material selection is a critical component of the design process, end users are specifying VICTREX PEEK polymer to improve part performance, exploit greater design freedom, create a differentiated application, and reduce systems costs.

- ▲ Mobile phones
- ▲ Circuit boards
- ▲ Printers

- ▲ LEDs
- ▲ Connectors
- ▲ Batteries
- ▲ HDD (Hard disk drives)

- ▲ Computers
- ▲ Switches





Advantages

VICTREX PEEK polymer is a high performance thermoplastic whose unique combination of properties can be customized to meet the growing demands of the electronics industry. These include:

- ▲ **High Temperature Resistance**
Has a heat resistance of up to 315°C (600°F). Maintains strength and dimensional stability with the increased temperatures associated with lead-free solder systems. No deformation following reflow at 250°-280°C (482-536°F) for 5-10 seconds.
- ▲ **Wear Resistance**
High mechanical strength and abrasion resistance.
- ▲ **Dimensional Stability**
Filled materials reduce coefficient of thermal expansion (CTE) and increase heat distortion temperature (HDT). Maintains tight dimensional control.
- ▲ **Low Outgassing**
Reduced contamination improves component reliability in applications requiring purity (HDD, wafer cassettes, etc.)
- ▲ **Low Moisture Absorption**
Important in maintaining dimensional stability and insulation properties.

VICTREX PEEK polymer provides electronic components with an exceptional combination of strength and wear properties resulting in greater part functionality, reliability and cost savings for designers.

- ▲ **Eco-Compliant (Green) FR Systems**
Naturally flame retardant without the need for additives (halogens, bromines, etc.).
- ▲ **Chemical Resistance**
Outstanding resistance to a wide range of chemical and corrosive environments even at elevated temperatures up to 200°C (392°F).
- ▲ **Low Particle Generation**
Ensures uncompromised component functionality and reliability. Important when components are sensitive to any particulate shedding which could impact component performance.
- ▲ **Fully Recyclable**
Unlike numerous epoxy systems, VICTREX PEEK polymer is fully recyclable, providing environmental and regulatory benefits as well as aftermarket cost efficiency.
- ▲ **Processing Flexibility**
Easily processed using conventional equipment.

COMPARISON OF THERMOPLASTIC POLYMERS - ELECTRONICS

Material	PC	PEI	PPS GL10	LCP GL10	VICTREX PEEK 450G	VICTREX PEEK 450CA30
Type	Unfilled resin	Unfilled resin	10% Glass fiber	10% Glass fiber	Unfilled resin	30% Carbon fiber
Specific Gravity	1.19	1.27	1.42	1.48	1.32	1.40
Melting Point °C	No	No	-	High melt point LCP	343 (649.4°F)	343 (649.4°F)
Processing Temp °C	290-315 (554-599°F)	350-400 (662-752°F)	310-330 (590-626°F)	330-365 (626-689°F)	350-400 (662-752°F)	350-400 (662-752°F)
Heat Deflection Temp °C 1.8 MPa	130 (266°F)	200 (392°F)	-	265 (509°F)	156 (312.8°F)	330 (626°F)
Flexural Modulus (MPa)	2300	3300	6900	10000	4200	21000
Tensile Strength (MPa)	60	110	70	160	100	240
Chemical resistance	Poor	Fair	Good	Excellent	Excellent	Excellent

...for performance



Mobile Phones

VICTREX PEEK polymer is helping mobile handset manufacturers to optimize their product designs and reduce their manufacturing costs. Because of the polymer's ability to maintain its mechanical properties while being injection molded, VICTREX PEEK polymer can be mass produced in a virtually limitless number of complex and intricate designs. It can even be processed into a plate that's just 0.2 mm thick.

When used to replace metal, VICTREX PEEK polymer reduces the weight of components — a critical benefit for today's sophisticated handset designs. And, in terms of torque retention, VICTREX PEEK polymer performs better than metal. A significant advantage of using VICTREX PEEK polymer is its superior processability which makes it a very cost-effective material solution for electronic components.

Key benefits

- ▲ Able to pass lead-free solder process at 250-280°C (482-536°F) for 5-10 seconds for multiple cycles
- ▲ Thin wall — able to fill the part thickness down to 0.1-0.2mm
- ▲ Significantly greater design flexibility compared with metal injection molded (MIM) parts
- ▲ Light weight



Laser Printers

Today's laser printers are required to provide multi-functionality, higher speed and better-quality images. To meet these requirements, engineers need to work on more demanding designs in which materials deliver high heat resistance and exceptional mechanical strength, as well as higher wear and torque resistance. VICTREX PEEK polymer provides a material solution for these increasingly stringent requirements, especially the ones for the fusing section of the laser printers. The ability of VICTREX PEEK polymer to maintain mechanical properties at high temperatures makes it an excellent material candidate for a variety of parts including heat roller gears, guide claws, bushings, etc.

Key benefits

- ▲ Continuous-use temperature up to 260°C (500°F)
- ▲ Superior wear resistance at high temperature, 120-240°C (248-464°F)
- ▲ High torque resistance at high temperature
- ▲ High melting point, 374°C (705°F) of VICTREX PEEK-HT. Able to survive the PFA coating processing temperature of 330-360°C (626-680°F)
- ▲ Low coefficient of friction



Audio Speakers

Designers of speaker components rely on high temperature resistant materials to improve the overall power capacity of components such as spiders, acoustic diaphragms, coils, and front suspensions. These components are required to have outstanding heat resistance because a high percentage of electrical power delivered by a speaker's amplifier is dissipated in the form of heat. VICTREX PEEK polymer provides a high melt temperature and a continuous operating temperature of up to 260°C (500°F). The polymer's high strength and heat resistance enables components to withstand significant displacement. VICTREX PEEK polymer film can be used to provide better acoustic performance.

This performance combination, coupled with the polymer's inherent ease of processing can simplify the manufacturing process and improve productivity.

Key benefits

- ▲ Heat resistance — continuous-use temperature up to 260°C (500°F)
- ▲ Superior acoustic quality
- ▲ Better processability vs. PI
- ▲ Chemical resistance
- ▲ Fatigue resistance

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Victrex Polymer Solutions, a division of Victrex plc, is the world's leading manufacturer of Polyaryletherketones, high performance polymers, which are sold under the brand names VICTREX® PEEK polymer, VICOTE® Coatings, APTIV® films and VICTREX Pipes™. With production facilities in the UK backed by sales and distribution centres serving more than 30 countries worldwide, our global market development, sales, and technical support services work hand-in-hand with OEMs, designers and processors offering assistance in the areas of processing, design and application development to help them achieve new levels of cost savings, quality, and performance.

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