



Innovations in High Performance Polyaryletherketone Victrex Polymer Solutions – Product and Technology Overview



With over 30 years of focus and experience Victrex Polymer Solutions, a division of Victrex plc, is the world's leading manufacturer of high performance polyaryletherketones, including VICTREX® PEEK polymer. Demands for higher performing and more efficient products combined with an increasing rate of change driven by shorter product life cycles and product development timeframes requires companies to provide cost effective solutions to meet these challenges. Victrex provides a wide range of polyaryletherketone products, technical service and support to our customers and end users on a global basis to help them deliver innovative cost effective solutions to the market. Working together we identify material and technical solutions that meet the most difficult design challenges. Using our high performance materials can help to achieve weight reduction, enhanced energy efficiency, the ability to produce smaller yet more powerful and functional devices, an increase in application lifetime, enhanced performance, compliance with legislation and environmental regulations, and overall lower cost.

Having the most diversified product range of all suppliers of polyaryletherketone allows us to offer different viscosities and a wide range of product modifications to meet customer requirements. Victrex materials are used successfully in a wide range of applications. When compared with other polymers such as LCPs, PPS, PEI, and polyimides PI and PAI, or polysulfones like PES, fluoropolymers PTFE, and polyamides, VICTREX PEEK polymers exhibit superior performance properties including temperature, chemical and wear resistance, process ability, hydrolysis resistance, and electrical properties. When displacing metals like light weight alloys, aluminum and steel, Victrex materials provide design freedom, enhanced chemical resistance, and manufacturing cost reduction, to facilitate, for example, significant weight savings.

Light weight, fully recyclable, halogen-free, and RoHS compliant, Victrex polymers can be processed using standard thermoplastic techniques (injection molding, compression molding, blow molding and extrusion) and are available as film, pipe and coatings. Finished forms such as stock shapes, compression molded parts and fibers are available from Victrex sales partners.

PRODUCT INNOVATIONS

- **VICTREX® PEEK Polymer** — VICTREX PEEK polymer is a linear, aromatic, semi-crystalline polymer widely regarded as one of the highest performing thermoplastics in the world. It provides a unique combination of high performance properties over a wide range of temperatures and extreme conditions. VICTREX PEEK polymer and compounds typically have a glass transition temperature of 143°C (289°F) and a melting temperature of 343°C (649°F). The polymer's design and processing flexibility allows it to be used as a replacement for metals and other materials in many types of demanding applications.

- **VICTREX® PEEK High Flow Polymers** — Designed for injection molding thin-walled intricate parts; they can be used unfilled or with the capability for high filler loadings, offering ease of processing, shorter cycle times, and outstanding performance. The excellent weld line strength compared to LCP and PPS enables use for design of thin wall moldings and micro parts.
- **VICTREX® HMF Polymer** — Carbon fiber filled compounds high flow resins with 20% and 40% carbon fibers which combine easy process ability with superior mechanical performance and improved fatigue performance when compared to light weight alloys. The perfect material for replacement of light weight alloys.
- **VICTREX® HT™ Polymer** — With a glass transition temperature of 157°C (315°F) and a melting temperature of 374°C (705°F), it offers superior high temperature performance while delivering toughness, strength and chemical resistance. Available in unfilled, glass and carbon reinforced grades.
- **VICTREX® ST™ Polymer** — It is designed to perform in the most demanding environments specifically in applications requiring a combination of high temperature, mechanical performance and dimensional stability. With a glass transition temperature of 165°C (329°F) and a melting temperature of 389°C (732°F), it opens up new application opportunities for customers who work at temperatures over 300°C (572°F) such as in the electronics and energy industries. Available in unfilled, glass and carbon reinforced grades.
- **VICTREX® WG™ Polymers** — Premium PTFE-free wear grades provide excellent wear rate and a reduced and very stable coefficient of friction to meet customer requirements for wear at higher speed and load application performance.

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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.

- **VICTREX® PAEK Polymers for Composites** — Victrex polymers are successfully used in a variety of forms (powder, film and filament) as a matrix material in the manufacture of advanced thermoplastic composite prepregs made of carbon, glass or aramid continuous fibers. Victrex polymers are engineered to provide optimum impregnation of the reinforcing fibers and fiber-matrix interface. They are recyclable and are cost-effective to process by thermoforming out-of-autoclave or more innovative techniques, such as thermoplastic film bagging. The material's outstanding mechanical properties and processability make it an excellent substitute for metals and thermosets in a wide range of aerospace, offshore, medical and industrial applications.
- **VICTREX Pipes™** — Extruded pipe and tubes produced from Victrex polymers for use in oil and gas, aerospace and industrial applications. They offer high temperature performance, excellent chemical resistance, weight reduction compared to metals, coupled with mechanical properties, wear and excellent permeability resistance to offer overall reliability for applications in extreme operating conditions.
- **APTIV® Films** — Providing all of the properties of VICTREX PEEK polymer in a thin, flexible format. The

outstanding balance of properties which includes high temperature resistance, excellent chemical resistance, low moisture absorption, toughness and high purity makes it the highest performing, most versatile thermoplastic film available. APTIV films are available in both amorphous and crystalline grades with a variety of fillers which enhance mechanical, dimensional stability, and wear resistance properties. Additionally the thermoplastic nature of the film lends itself to a wide range of conversion processes including thermal lamination, thermoforming, laser machining and laser welding. Depending on the grade films are available in a thickness range from 6 to 750 microns and in roll widths up to 1450 mm (57.09 in).

- **VICOTE® Coatings** — A dedicated range of eco-friendly, high performance coatings, manufactured from VICTREX PEEK polymers and is available in powder and aqueous dispersions, providing high temperature performance, exceptional scratch and wear resistance, high strength and durability. When formed into a thin film coating on metal parts they provide unmatched all round temperature, wear, abrasion and chemical resistance to extend the life of applications and overcome deficiencies that exist with current coatings in abrasion resistance and poor performance at elevated temperatures.

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