

PEEK Sheet, Rod & Films

Property

Product Name: PEEK.
Chemical Name and Synonym: Polyether ether ketone.

Material Names

PEEK is sold under a variety of brand names including schulatec PEEK, cn peek.

PEEK

Polyether ether ketone (PEEK) is a colourless organic thermoplastic polymer in the polyaryletherketone (PAEK) family, used in engineering applications. The polymer was first developed in November 1978, later being introduced to the market by Victrex PLC, then Imperial Chemical Industries (ICI) in the early 1980s.

PEEK polymers are obtained by step-growth polymerization by the dialkylation of bisphenolate salts. Typical is the reaction of 4,4'-difluorobenzophenone with the disodium salt of hydroquinone, which is generated in situ by deprotonation with sodium carbonate. The reaction is conducted around 300 °C in polar aprotic solvents - such as diphenyl sulfone.

Property

PEEK is a semicrystalline thermoplastic with excellent mechanical and chemical resistance properties that are retained to high temperatures. The processing conditions used to mould PEEK can influence the crystallinity and hence the mechanical properties. Its Young's modulus is 3.6 GPa and its tensile strength is 90 to 100 MPa. PEEK has a glass transition temperature of around 143 °C (289 °F) and melts around 343 °C (662 °F). Some grades have a useful operating temperature of up to 250 °C (482 °F). The thermal conductivity increases nearly linearly with temperature between room temperature and solidus temperature. It is highly resistant to thermal degradation, as well as to attack by both organic and aqueous environments. It is attacked by halogens and strong Brønsted and Lewis acids, as well as some halogenated compounds and aliphatic hydrocarbons at high temperatures. It is soluble in concentrated sulfuric acid at room temperature, although dissolution can take a very long time unless the polymer is in a form with a high surface-area-to-volume ratio, such as a fine powder or thin film. It has high resistance to biodegradation.

Applications

PEEK is used to fabricate items for demanding applications, including bearings, piston parts, pumps, high-performance liquid chromatography columns, compressor plate valves, and electrical cable insulation. It is one of the few plastics compatible with ultra-high vacuum applications, which makes it suitable for aerospace, automotive, teletronic, and chemical industries. PEEK is used in medical implants, e.g., use with a high-resolution magnetic resonance imaging (MRI), for creating a partial replacement skull in neurosurgical applications.

PEEK is used in spinal fusion devices and reinforcing rods. It is radiolucent, but it is hydrophobic causing it to not fully fuse with bone. PEEK seals and manifolds are commonly used in fluid applications. PEEK also performs well in high temperature applications (up to 500 °F/260 °C). Because of this and its low thermal conductivity, it is also used in FFF printing to thermally separate the hot end from the cold end.

Jiangxi Beluns Plastics Co., Ltd. is a professional manufacturer of high performance plastics, fluoroplastics and general engineering plastics such as plates, bars, films and various special-shaped parts. The raw materials for plastic products can be processed according to the brand type specified by the customer. Extrusion, molding, turning, cnc processing are our main processing types. Products made from each material have different uses. Please contact us to select the appropriate plastic material for processing. Some of the data comes from the Internet, Understand if something is wrong.

Processing options

PEEK melts at a relatively high temperature (343 °C / 649.4 °F) compared to most other thermoplastics. In the range of its melting temperature it can be processed using injection moulding or extrusion methods. It is technically feasible to process granular PEEK into filament form and 3D printing parts from the filament material using fused deposition modeling – FDM (or fused filament fabrication – FFF) technology. PEEK filaments have been demonstrated for producing medical devices up to class IIa. With this new filament, it is possible to use the FFF method for different medical applications like dentures.

In its solid state PEEK is readily machinable, for example, by (CNC) milling machines and is commonly used to produce high-quality plastic parts that are thermostable and both electrically and thermally insulating. Filled grades of PEEK can also be CNC machined, but special care must be taken to properly manage stresses in the material.

PEEK is a high-performance polymer, but its high price restricts its use to only the most demanding applications

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