PEEK Application and Capabilities Guide

Extruding high-performance thermoplastics into products that enable innovation across markets.
PEEK (polyetheretherketone) is a strong, versatile material with excellent purity, high tensile strength, temperature resistance (500°F/260°C), dielectric strength, and lubricity. Design engineers in diverse markets such as medical devices and energy opt to use PEEK in their applications because of its high-performance properties.

MARKETS SERVED

AEROSPACE
PEEK's various extruded forms such as PEEKshrink®, Convoluted Tubing, and Drawn Fiber can all be utilized as lightweight wire management products. PEEKshrink® is an ideal splicing aid or insulating product while PEEK Insulated Wire can provide an abrasion resistant wire coating over solid or braided conductors.

AUTOMOTIVE
PEEK is an excellent material for protecting wires, decreasing weight to increase fuel efficiency. PEEK Drawn Fiber is a perfect braiding material for wires and cables due to its chafe resistance. PEEK Insulated Wire and PEEKshrink® can accelerate electrical performance to power automobiles for electric generation.

FIBER OPTICS
PEEK can be extruded into multi-lumens, allowing multiple channels to encapsulate fibers independently in one OD. PEEK tubing is also an excellent sheathing for fiber optics because of its strength. PEEK Convoluted Tubing is a highly abrasion resistant flexible solution that can operate in a variety of temperature extremes up to 500°F (260°C). PEEK Engineered Surface Tubing can be an excellent loose sheathing for fiber to decrease strain as it has increased lubricity.

FLUID HANDLING
PEEK extruded tubing possesses high tensile strength and an excellent burst pressure rating for high-performance liquid chromatography (HPLC) applications. It is chemically inert and can also be heat formed into unique profiles and shapes.

MEDICAL
PEEK extrusions are used in medical applications due to its columnar stiffness and tight bend radius in thin walls which helps maneuver catheters through the body’s tortuous pathways. This material can be sterilized using gamma, ethylene oxide (EO or EtO), e-beam or autoclave.

ENERGY
PEEK Insulated Wire is a popular choice for insulating electric motors, especially in SAGD (Steam-Assisted Gravity Drainage) environments. PEEKshrink® makes an excellent splicing aid for PEEK insulated wire which can boast more than 3,000 v/mil of insulation resistance.

EXTRUDED PEEK PRODUCTS

DRAWN FIBER
PEEK Drawn Fiber is a high tensile, abrasion resistant fiber commonly used in braiding applications for wires and cables.

EXTRUDED TUBING
We can extrude PEEK tubing in a variety of diameters and wall thicknesses (ranging from 0.002” to 0.062”). Tolerances and sizes can be customized to meet the most demanding design requirements.
HEAT SHRINK
We are the world’s first manufacturer of heat shrinkable PEEK, known as PEEKshrink®. This product provides an ideal “shrink to fit” layer of protection – available with shrink ratios up to 1.4:1 – which protects wiring and components from elemental extremes.

INSULATED WIRE
This extrusion of PEEK over wire is an ideal magnet or motor winding insulation and electromechanical applications. PEEK Insulated Wire delivers outstanding performance at high continuous service temperatures up to 500°F (260°C), along with excellent abrasion and chemical resistance and dielectric strength.

THERMALLY STABLE PEEK COATED OPTICAL FIBER
Our Thermally Stable PEEK Coated Optical Fiber retains all the benefits of PEEK even during dramatic temperature fluctuations from -10°C (-14°F) to 260°C (500°F) without attenuation, or compression. This performance coating experiences significantly less loss at the tightest bend radius.

PEEK MULTI-LUMENS & CUSTOM PROFILES
Extrusion of multi-lumens and custom profiles with PEEK allows for multiple channels within one tube, or complex shapes for a variety of product options. To get started, send us your CAD file(s) or concept drawing to see how we can make a customized extrusion for you.

PEEK’s ability to be extruded in a variety of products such as extruded tubing, drawn fiber, insulated wire, PEEKshrink® (heat shrink), multi-lumen and thin-walled Sub-Lite-Wall® tubing enables end users to push the boundaries of innovation. Its high tensile strength, columnar stiffness, and light weight positions it to be an ideal replacement for stainless steel and other metals.

### PEEK Capabilities

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<thead>
<tr>
<th></th>
<th>Extruded Tubing</th>
<th>Heat Shrink Tubing (up to 1.4:1)</th>
<th>Insulated Wire</th>
<th>Drawn Fiber</th>
<th>PEEK Coated Optical Fiber</th>
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</thead>
<tbody>
<tr>
<td>Inner Diameter (ID)</td>
<td>0.002” - 2.0”</td>
<td>0.025” - 2.0”</td>
<td>0.030” - 2.1”</td>
<td>0.002”</td>
<td>0.010” - 0.030”</td>
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<tr>
<td>Wall</td>
<td>0.002” - 0.62”</td>
<td>0.003” - 0.015”</td>
<td>0.003” - 0.015”</td>
<td>0.001”</td>
<td>0.001” - 0.020”</td>
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<tr>
<td>Expanded ID Minimum</td>
<td>0.0” - 2.1”</td>
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<tr>
<td>AWG</td>
<td>40” - 3”</td>
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<tr>
<td>Wall</td>
<td>0.001” - 0.026”</td>
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SECONDARY/VALUE-ADD

We have an impressive array of optimized tubing solutions for advanced applications. By having us perform these secondary services and operations, you can experience increased economies of scale, improved yields and manufacturing efficiencies.

- FLARING
- FLANGING
- DRAW DOWN
- ENGINEERED SURFACE
- DRILLING
- CONVOLUTED
- SPIRAL CUTTING

Contact us at (803) 268-9500 to see how our team can engineer a PEEK solution for your applications.
Meet Zeus.

- OVER 50 YEARS OF INDUSTRY SOLUTIONS -
Zeus delivers precision polymer solutions that transform businesses, markets and lives. We have dedicated ourselves to building partnerships, products and services for the benefit of our customers.

Headquartered in Orangeburg, South Carolina, Zeus employs approximately 1,300 people and operates multiple facilities around the world.