

Technical Data Sheet

Polyether Ether Ketone (PEEK)

Chemical Name(s): Polyether Ether Ketone
Common Abbreviation(s): PEEK
Available Profiles: Sheet, Rod

PEEK is a high-performance engineering thermoplastic known for its exceptional mechanical strength, thermal stability, and chemical resistance. It is widely used in demanding applications across aerospace, automotive, medical, and chemical industries, where extreme conditions of temperature, pressure, and chemical exposure are common.

Benefits:

- Exceptional mechanical strength and rigidity
- High thermal stability, capable of withstanding extreme temperatures
- Excellent chemical resistance to aggressive chemicals, solvents, and acids
- Outstanding wear and abrasion resistance
- Good electrical insulating properties
- High radiation resistance

Common Applications:

- High-performance seals, bearings, and bushings
- Aerospace components
- Medical implants and devices (e.g., spinal cages)
- Chemical processing equipment
- Automotive components (e.g., gears, valves)
- Semiconductor and electronic applications

TYPICAL PROPERTIES of POLYETHER ETHER KETONE (PEEK)

| | Property | Test Method | Value |
|------------------------------|---|-------------|------------------------|
| Physical Properties | Density (g/cm ³) | ATSM D792 | 1.30 |
| | Water Absorption (%) | ASTM D570 | 0.10 |
| Mechanical Properties | Tensile Strength at 23°C (MPa) | ASTM D638 | 97 |
| | Tensile Modulus (MPa) | ASTM D638 | 3700 |
| | Tensile Elongation at Break (%) | ASTM D638 | 20 |
| | Flexural Strength (MPa) | ASTM D790 | 165 |
| | Flexural Modulus (MPa) | ASTM D790 | 4200 |
| | Compressive Strength (MPa) | ASTM D695 | 118 |
| | Impact Strength (kJ/m ²) | ASTM D256 | 6.5 |
| Thermal Properties | Coefficient of Linear Thermal Expansion (mm/mm/°C) | ASTM D696 | 4.7 x 10 ⁻⁵ |
| | Heat Deflection Temperature at 0.45 MPa (°C) | ASTM D648 | 152 |
| | Approx. Melting Temperature (°C) | ASTM D3418 | 343 |
| | Max Operating Temperature (°C) | - | 260 |
| Electrical Properties | Dielectric Strength (kV/mm) | ASTM D149 | 20 |
| | Dielectric Constant at 1 MHz | ASTM D150 | 3.2 |
| | Dissipation Factor at 1 kHz | ASTM D150 | 0.002 |
| | Surface Resistivity (ohm/sq) | ASTM D257 | >10 ¹⁴ |
| | Arc Resistance (sec) | ASTM D495 | 120-160 |
| Flammability | Flammability Rating | UL94 | V-0 |
| Standards Compliance | ASTM D638, D790, D695, D257 compliant ISO 10993 compliant for medical-grade applications FDA compliant for food contact (medical and implantable grades) | | |
| Environmental Considerations | Recyclability: PEEK is recyclable, but due to its high-performance nature, specific recycling processes may be required. Environmental Impact: PEEK is durable and highly resistant to harsh conditions, reducing the need for replacement and extending life. | | |

