



PEKK VS. PEEK IN FFF



❖ KEPSTAN[®] resin is a high performance thermoplastic material based on a highly stable backbone of PolyEtherKetoneKetone (PEKK). Its semi-crystalline structure offers an outstanding combination of mechanical and thermal strength together with chemical and fire resistance.

❖ PEKK and PEEK are both in the Polyaryletherketone family of ultra-high performance polymers.

❖ Unlike PEEK, Kepstan[®] PEKK is a copolymer with a slower and highly tunable crystallization rate making it the preferred choice for additive manufacturing.

❖ Kepstan[®] PEKK can be printed directly in either the amorphous or semi-crystalline state, or printed amorphous and crystallized in a secondary process, offering the ultimate combination in performance and processing flexibility.



KEPSTAN[®] PEKK BENEFITS OVER PEEK:

- ❖ Better layer adhesion
- ❖ Lower print temperatures
- ❖ Improved dimensional stability (less warping)
- ❖ Faster print speeds
- ❖ Production of amorphous or semi-crystalline parts
- ❖ Ability to print larger parts

PEKK FILAMENT

LOW temperature build chamber

Amorphous PEKK

HIGH temperature build chamber

Semi-crystalline PEKK



KEPSTAN® PEKK IS AVAILABLE AS FILAMENT FOR ADDITIVE MANUFACTURING – CONTACT ARKEMA TO LEARN MORE

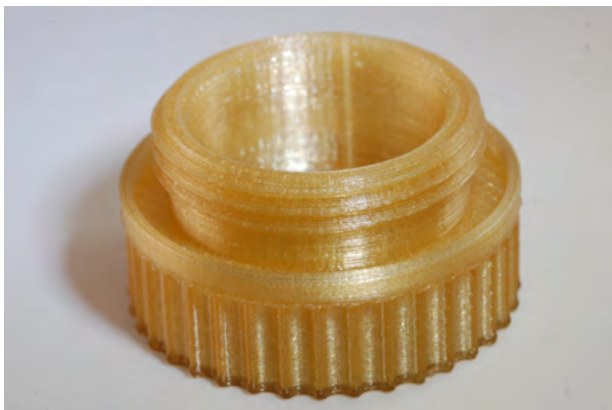
| Processing Temperatures (°C) | PEEK | PEKK |
|------------------------------|---------|---------|
| Extruder Temperature | 375-450 | 350-380 |
| Bed Temperature | 130-145 | 120-140 |
| Enclosure Temperature | 90-200 | 25-150 |

PEKK can be printed on most machines with a hot end capable of reaching 350-380°C with or without a heated chamber.

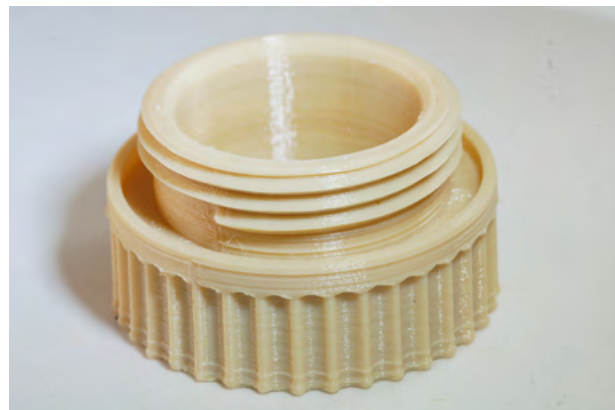
PEKK and PEEK are high performance polymers with similar properties, but printed PEKK parts tend to have better dimensional stability and layer adhesion.

| Printed Part Properties | Condition | Test Method | Unit | PEEK | PEKK |
|----------------------------|---------------------|------------------------|------|----------|----------|
| Tensile Strength | Annealed, X/Y, 23°C | ISO 527-1BA (modified) | MPa | 80 - 105 | 80 - 100 |
| | Annealed, Z, 23°C | ISO 527-1BA (modified) | MPa | <20 | 48-65 |
| Tensile Elongation (break) | Annealed, X/Y, 23°C | ISO 527-1BA (modified) | % | 5-10 | 6-10 |
| | Annealed, Z, 23°C | ISO 527-1BA (modified) | % | 1-3 | 4-6 |

| Intrinsic Material Properties | Condition | Test Method | Unit | PEEK | PEKK |
|-------------------------------|--------------------|--------------|-------------------|------|------|
| Tensile Modulus | 23°C | ISO 527-1BA | GPa | 3.7 | 3.9 |
| Tensile Strength | 23°C | ISO 527-1BA | MPa | 105 | 110 |
| Melting Point | | DSC | °C | 343 | 334 |
| Glass Transition (Tg) | | DSC | °C | 143 | 162 |
| Density | 23°C | ISO 1183 | g/mm ³ | 1.30 | 1.29 |
| Limiting Oxygen Index | > 1.6 mm thickness | ISO 4589 | % O ₂ | 35 | 35 |
| Flammability | | UL 94 1.5 mm | | V0 | V0 |



Amorphous Kepstan® PEKK part



Semi-crystalline Kepstan® PEKK part

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