Apium Specialty Filaments - PEEK

High Performance Polymers

Extreme Temperature Plastics

PBI
PI
SRP
PAI
TPI

PAEK
PEEK
CFR PEEK

High Temperature Plastics

PPSU
PEI
PESU
PSU

LCP
PAR
PARA
PPA

PBS
PA11
PA12

Engineering Plastics

Commodity Plastics

PC - PC Alloys - (m)PPO
(m)PPE - mPPE | mPPO
PS - **ABS** - PMMA
SAN - PVC

POM-C - PBT - PA6 - PA66
PVDF - PETG - PEX - UHMWPE
PET - **PP** - PE
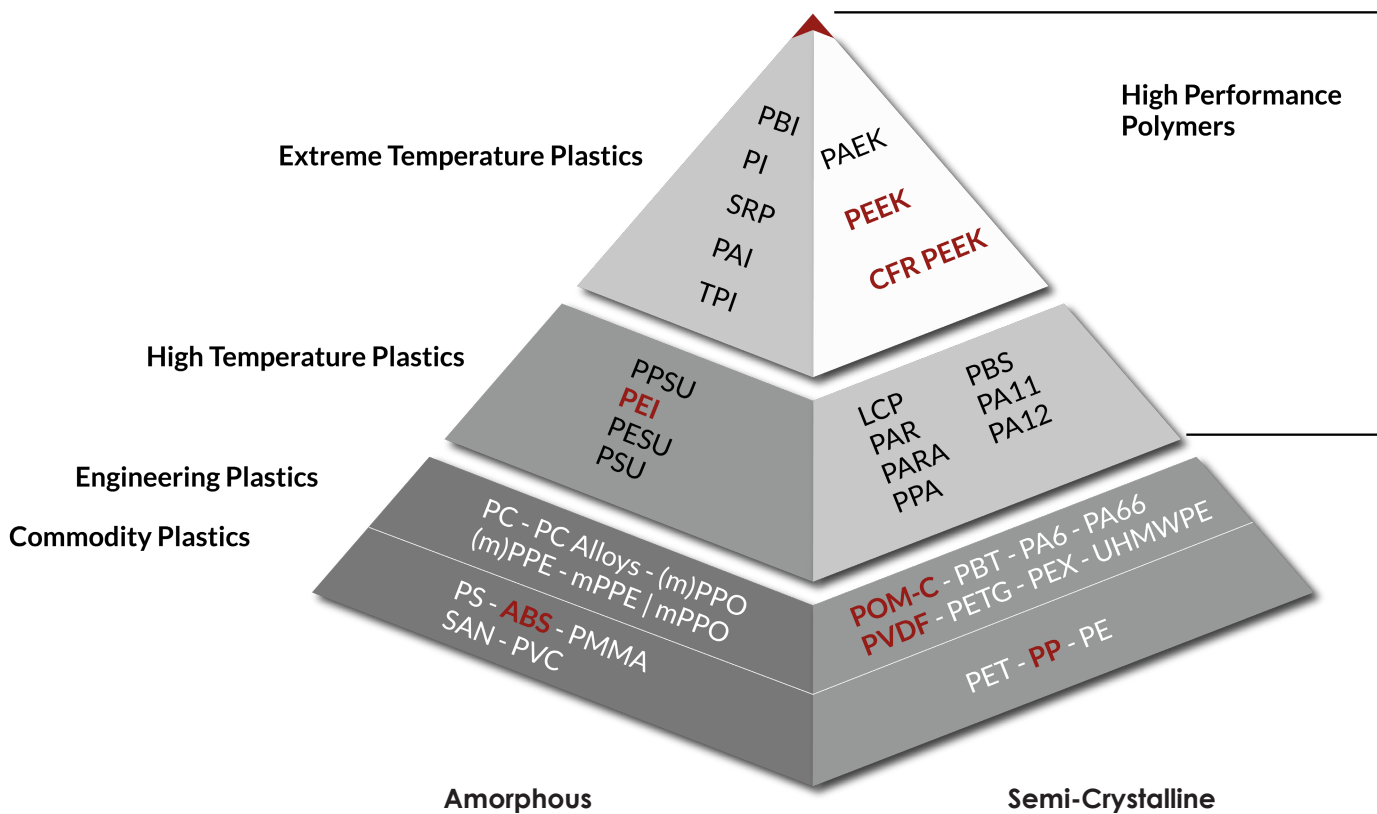
Amorphous

Semi-Crystalline

Semi-Crystallinity of PEEK

PEEK is a semi-crystalline material. Semi-crystalline materials have distinct characteristics compared to amorphous materials. Semi-crystalline materials have well-defined melting point, good chemical, fatigue and wear resistance. Proper attention must be paid to the temperature control during printing to ensure it is regulated well to produce parts of consistent crystallinity with good properties.

Apium P220 Series 3D printers allow the printing of PEEK parts with 29-32% crystallinity, the closest ratio in the 3D printing industry to 35% crystallinity of injection moulded PEEK parts.

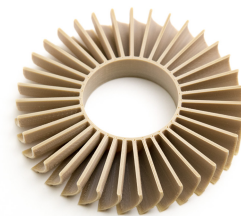## Characteristics of 3D Printed Semi-Crystalline PEEK

The professional PEEK 3D printers of Apium are capable of processing industrial grade PEEK filaments with the highest quality in 3D printing industry.

Characteristics of 3D printed PEEK with Apium`s technology:

- High mechanical strength
- Good chemical resistance
- High temperature resistance
- Flame Retardant
- Lightweight
- Excellent wear resistance
- Good fatigue resistance

PEEK Filament - High Performance Semi-Crystalline Material

MECHANICAL PROPERTIES	CONDITIONS	TEST METHOD	VALUE
Tensile Strength XY	23 °C, 48% Humidity	DIN EN ISO 527	77,2 MPa
Tensile Strength YZ	23 °C, 48% Humidity	DIN EN ISO 527	85,4 MPa
Tensile Strength Z	23 °C, 48% Humidity	DIN EN ISO 527	20,5 MPa
Tensile Elongation XY	23 °C, 48% Humidity	DIN EN ISO 527	3 %
Tensile Elongation YZ	23 °C, 48% Humidity	DIN EN ISO 527	2,6 %
Tensile Elongation Z	23 °C, 48% Humidity	DIN EN ISO 527	0,6 %
Tensile Modulus XY	23 °C, 48% Humidity	DIN EN ISO 527	3 GPa
Tensile Modulus YZ	23 °C, 48% Humidity	DIN EN ISO 527	3,8 GPa
Tensile Modulus Z	23 °C, 48% Humidity	DIN EN ISO 527	3,2 GPa
Flexural Strength XY	23 °C, 48% Humidity	DIN EN ISO 527	31 MPa
Flexural Strength YZ	23 °C, 48% Humidity	DIN EN ISO 527	75,6 MPa
Flexural Strength Z	23 °C, 48% Humidity	DIN EN ISO 527	43,6 MPa
Flexural Modulus XY	23 °C, 48% Humidity	DIN EN ISO 527	5,6 GPa
Flexural Modulus YZ	23 °C, 48% Humidity	DIN EN ISO 527	7,7 GPa
Flexural Modulus Z	23 °C, 48% Humidity	DIN EN ISO 527	10,6 GPa
Charpy Impact Strength XY	23 °C, 48% Humidity	DIN EN ISO 179	34,88 kJ/m²
Charpy Impact Strength YZ	23 °C, 48% Humidity	DIN EN ISO 179	9,62 kJ/m²
Charpy Impact Strength Z	23 °C, 48% Humidity	DIN EN ISO 179	2,94 kJ/m²

High Performance Solutions
PEEK - Applications
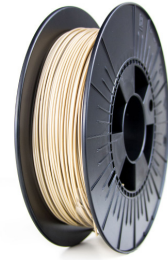
Aerospace

PEEK is your lightweight material solution where manufacturing costs, durability in harsh environments and processing flexibility play a significant role. It offers great benefits for landing gear hubcaps, aircraft door handles, cable ties, composite fasteners, as housing for fire prone components and many more applications.

Automotive

PEEK exhibits an excellent combination of strength, durability and heat resistance. PEEK is the material solution where system weight, energy efficiency and a wide range of operating temperatures (-196°C to 260°C) play a significant role in your operations.

Oil & Gas

PEEK is the material of choice for your oil and gas applications which require high quality equipment and tool systems to extreme temperatures, corrosive fluids and gases, and high pressures. For antenna sleeves, valve seats, electrical connectors, primary seals, impellers and many more system components, benefit from the outstanding characteristics of PEEK.
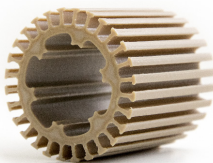
Semiconductors and Electronics

For the two main properties requirements -electrical insulation and mechanical function- of your electronics applications being contact sockets, insulators, wafer carriers, chemical cleaning systems, etc., PEEK is the material of choice with its outstanding properties.