



**PRECISION  
MACHINING**

Unrivalled Expertise.  
Unparalleled Results.

**WHAT CAN THIS  
POLYMER DO?**

# PEEK

(PolyEtherEtherKetone) is a lightweight highly chemical resistant thermoplastic popular in the Aerospace & Defense and Medical Industries.



## MATERIAL DETAILS

- High resistance to chemicals, moisture and steam.
- Withstands temperatures up to 480°F (250°C).
- Machined in a wide range of extruded and compression molded shapes and sizes.





# PEEK APPLICATIONS

Due to its elasticity and resistance to chemicals, abrasion and hydrolysis, PEEK is a highly sought-after thermoplastic in the Aerospace & Defense and Medical industries.

## Common uses include:

- Aerospace Weight Reduction Components
- Dental Implants
- Food and Beverage Automated Manufacturing Equipment
- Food and Beverage Filling
- Medical Implants
- Medical Instruments
- Metal Replacement
- Processing Equipment
- Semiconductor Manufacturing Equipment
- Vacuum Chamber Applications





# AEROSPACE & DEFENSE

In the Aerospace & Defense industry, it is applied to aircraft components for weight reduction, usually in place of metal parts.

With resistance to high temperatures and corrosive materials, PEEK provides a cost-effective alternative to the metal alloys traditionally used in aerospace, without sacrificing the ductile strength and mechanical qualities necessary for high-performance. Furthermore, in military aircraft, polymer components have the benefit of evading radar detection.

For over three decades, AIP has provided flight control, fuel system, interior, engine and aerodynamic-related PEEK components for various aircraft OEM and MRO providers worldwide.

## Products Machined for Aerospace and Defense:



Aircraft Engines,  
Systems and  
Structural  
Components



Chemical  
Detection Devices



Landing Gear  
Components



Military Targeting  
and Defense  
Sensors



Space and  
Satellite Devices





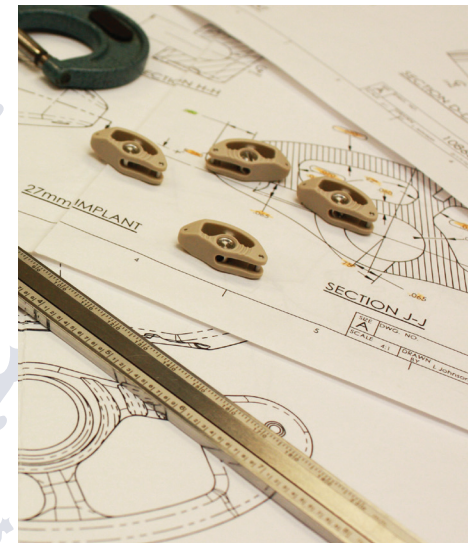
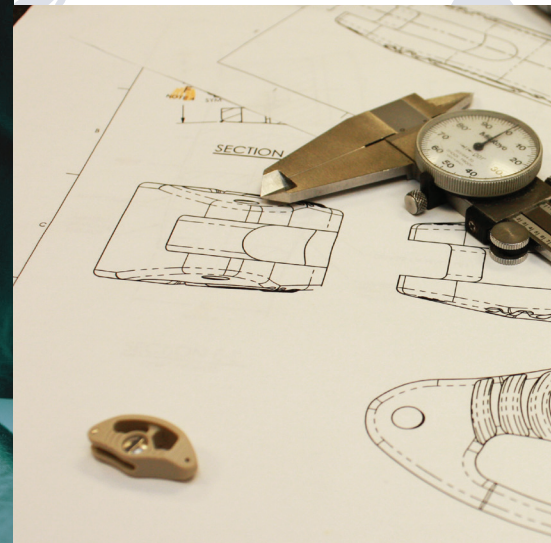


## MEDICAL & LIFE SCIENCES

In the Medical Industry, PEEK has a wide range of applications, such as medical instruments as well as dental and medical implants.

### PEEK Neurosurgical Case Study

One such example of PEEK's versatility is in neurosurgery for stroke and traumatic brain injuries. Dr. Rohit Khanna wanted to develop a device that would relieve swelling in the skull for patients undergoing brain surgery, sometimes multiple surgeries, which can lead to complications or even death. Dr. Khanna partnered with AIP Precision Machining engineers to create a device that would expand without another operation, yet hold the "bone flap" and the rest of the skull together. The polymer of choice? PEEK. AIP's engineers machined a medical component that



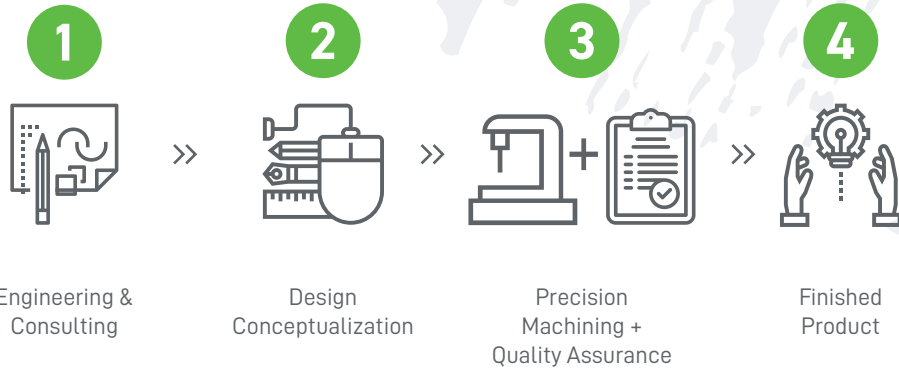
was flexible, strong and sensitive enough to fulfill the necessary requirements for this critical medical part. PEEK was also the best choice for this medical application because it was the most ductile and biocompatible. In preliminary tests with the PEEK surgical component, Dr. Khanna found the device was effective in reducing swelling in the brain and maintaining the structure of the skull. Currently, the FDA is processing the PEEK surgical piece for clearance to conduct clinical trials. If it is approved to move forward, it can make leaps and bounds in reducing the need for multiple brain surgeries, saving more lives.

# WHAT CAN AIP PRECISION MACHINING DO FOR YOU?

From concept to completion, our team of engineers will work with you to realize the final product. With some of the fastest lead times in the industry, our unrivaled technical experts can tackle your polymer challenges.

## CUSTOMIZED FOR YOUR APPLICATION

We're proud to offer a complex quality assurance process that focuses on product quality, fast delivery and cost-effective options.



# PEEK VARIANTS

	ASTM Test Method	Units	Keltron PEEK Compression Molding	Keltron PEEK 450G Injection Molding	Keltron PEEK Extruded Polyethylene ether-ketone	Keltron PEEK 450G3D Injection Molding	Keltron PEEK 450G3D Extruded Polyethylene ether-ketone	Keltron PEEK Optima L Injection Molding	Keltron PEEK Optima L Extruded Polyethylene ether-ketone	Keltron PEEK Optima L Extruded Polyethylene ether-ketone
1	Strength to Weight Ratio	-	-	-	-	-	-	-	-	-
2	Specific Gravity @ 73 F	-	D792	1.32	1.30	1.32	1.30	1.30	1.30	1.35
3	Tensile Strength @ 73 F (ult./yield)	psi	D638	15000(ult)	14100(ult)	15000(ult)	14100(ult)	14100(ult)	14100(ult)	13500(ult)
4	Tensile Modulus of Elasticity @ 73 F	psi	D638	450000	522000	450000	522000	522000	522000	500000
5	Tensile Elongation at Break @ 73 F	%	D638	1.0	5	20	5	5	5	15
6	Flexural Strength @ 73 F	psi	D790	25000	24450	25000	24450	24450	24450	21000
7	Flexural Modulus of Elasticity @ 73 F	psi	D790	600000	594500	600000	594500	594500	594500	575000
8	Shear Strength @ 73 F	psi	D732	-	7685(ult)	-	7685(ult)	-	7685(ult)	9000
9	Compressive Strength, (% Deformation) @ 73 F	psi	D695	17000(ult)	17255(ult)	17000(ult)	17255(ult)	17255(ult)	17255(ult)	21500(ult)
10	Compressive Modulus of Elasticity @ 73 F	psi	D695	450000	-	500000	-	-	-	430000
11	Hardness, Rockwell, Scale as noted @ 73 F	-	D785	-	-	-	-	-	-	-
12	Hardness, Durometer, Shore D @ 73 F	-	D2240	D85	-	D85	-	M99(R126)	M99(R126)	M95(R125)
13	Izod Impact, (Notched) @ 73 F	ft-lb/inch	D256 Type A	1.0	1.6	1.0	1.6	1.6	1.6	D85
14	Coefficient of Friction, (Dry vs. Steel Dynamic)	-	-	0.40	-	0.40	-	0.24	-	0.40
15	Limiting PV, (with 4 to 1 factor of safety applied)	psi-ft/min	-	12500	-	5500	-	13000	-	-
16	Coefficient of Linear Thermal Expansion @ 73 F	in/in/F	E-83(TMA)	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.8E-05
17	Heat Deflection Temperature @ 264 psi	F	D648	320	306	320	306	446	306	250
18	Tg-Glass Transition Temperature, (Amorphous)	F	D3418	-	289	-	289	289	289	-
19	Melting Point, (VS = Vicat Softening Temp)	F	D3418	644	644	644	644	644	644	540
20	Continuous Service Temperature in Air (Max.)	F	-	480	480	480	480	480	480	425
21	Thermal Conductivity	BTU-in/hr-sq-F	-	1.75	1.75	1.75	1.75	1.70	1.75	2.00
22	Dielectric Strength, Short Term	Volts/mil	D149	480	480	480	480	480	480	540
23	Volume Resistivity	ohm-cm	D257	4.9E+16	4.9E+16	4.9E+16	4.9E+16	4.9E+16	4.9E+16	4.5E+16
24	Dielectric Constant @ 10E6 Hz	-	D150	3.3	3.3	3.3	3.3	-	3.3	3.0
25	Dissipation Factor @ 10E6 Hz	-	D150	0.003	0.003	0.003	0.003	-	0.003	0.001
26	Flammability @ 3 min unless noted	-	UL94	V-0	V-0	V-0	V-0	V-0	V-0	V-0
27	Water Absorption, Immersion, 24 Hrs	% by wt.	D570(7)	0.15	0.50	0.10	0.15	0.06	0.05	0.01
28	Water Absorption, Saturation	% by wt.	D570(7)	0.50	0.50	0.50	0.50	0.30	0.50	0.03

Precision Machined Plastic Components

