



HexAM™ Additive Manufacturing

HexPEKK™ Components for Aviation, Space and Defense

The HexAM™ process combines a high-performance thermoplastic with selective laser sintering (SLS) technology to produce fully functional HexPEKK™ end-use components. HexPEKK™ parts offer significant weight, cost and time-to-market reduction compared to incumbent metal or composite technologies while still providing repeatable and validated engineering material properties.



Hexcel Hartford U.S. DDTC Registered AS9100D Certified

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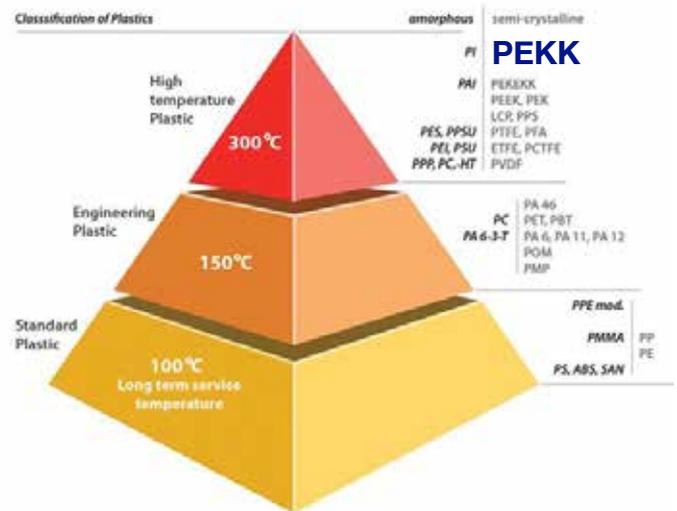
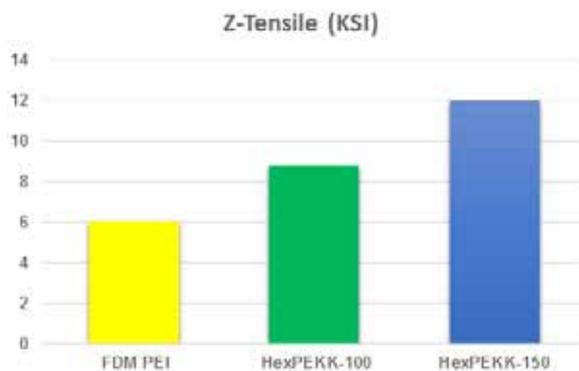
3D printed HexPEKK™ flight-ready parts

- World's Highest Performance Thermoplastic
- 30-60% Weight % Cost Savings
- Vertically Integrated Supply Chain
- Comprehensive B-Basis Qualified by FRL/NASA to +/- 300°F
- AS 9100D Certified

The HexAM™ additive manufacturing platform is ideal for high-performance aerospace applications. Hexcel's proprietary PEKK thermoplastic, processed with SLS technology, yields HexPEKK™ hardware with robust, repeatable material characteristics. HexPEKK™ parts are chemically resistant and low-outgassing, they have a wide temperature performance range and are

already used by customers for crewed space, satellite, military aviation, and defense applications. Combining the flexibility of select laser sintering technology with an engineering-grade material 50% lighter than aluminum, Hexcel's HexAM™ additive manufacturing platform is a perfect solution for your needs.

HexPEKK™ Materials Technology



Design Allowables

- B-Basis HexPEKK™-100 - 2,600 data points
- Space Allowable HexPEKK™-N - 800 data points
- Multiple machines
- Two material suppliers
- Final report is published

Capabilities of HexAM™ Process

Below are just a few examples of HexPEKK™ parts made using the HexAM™ process

Shape Optimized Brackets

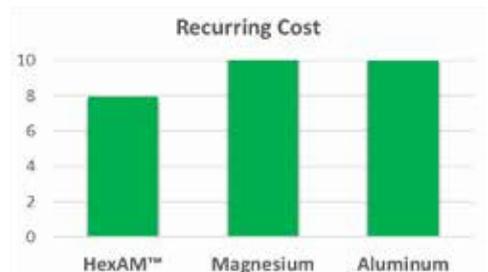
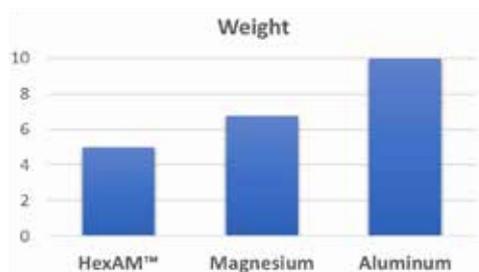
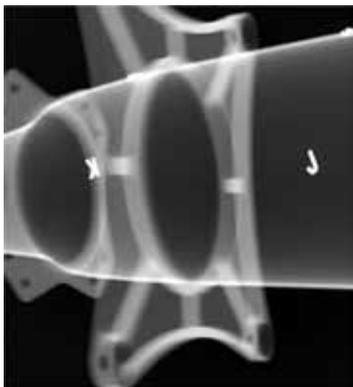
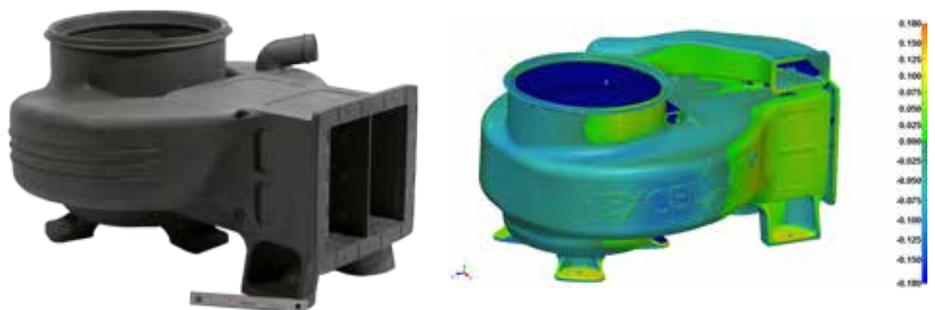


ECS Ducts



Benefits of HexPEKK™ Parts

- No tooling required
- Dimensional repeatability
- Lower cost
- Lower weight
- Superior laminate quality



Build Parameters

Print Dimensions				
Maximum Part Dimensions	mm x mm x mm		in x in x in	
		683.6 x 371.4 x 531		26.915 x 14.625 x 20.910
Thickness	mm		in	
	min	max	min	max
	2.03	25.4	0.08	1
Min As-sintered	mm		in	
Hole Diameter	1.27		0.05	

Engineering Properties

Property (units)	Orientation	Metric	English
Tension Strength (MPa, ksi)	XY	106.9	15.5
Tension Strength (MPa, ksi)	Z	60.3	8.75
Tensile Modulus (MPa, ksi)	XY	6343	920
Tensile Modulus (MPa, ksi)	Z	4847	703
Tensile Strain (%)	XY	2.3	2.3
Tensile Strain (%)	Z	1.4	1.4
Flexural Strength (MPa, psi)	XY	147.9	21450
Flexural Strength (MPa, psi)	Z	92.39	13400
Flexural Modulus (GPa, ksi)	XY	4.62	669
Flexural Modulus (GPa, ksi)	Z	4.35	631
Flexural Strain (%)	XY	3.4	3.4
Flexural Strain (%)	Z	2.3	2.3
Melting Temperature, T _m (°C, °F)		300	572
Glass Transition Temperature, T _g (°C, °F)		160	320
Service Temperature (°C, °F)		±148.9	±300
Surface Resistivity (Ω/sq)		< 1 x 10 ⁹	< 1 x 10 ⁹
Surface Resistivity (Ω*cm, Ω*in)		< 1 x 10 ¹¹	< 3.94 x 10 ¹⁰
Density (g/cm ³ , lb/in ³)		1.31	0.048
Poissons Ratio		0.4	0.4
Flammability (FAR Part 25.853 App F, 60s vertical)		Complies	

For more information

Hexcel is a leading worldwide supplier of composite materials to aerospace and industrial markets. For US quotes, orders and product information call toll-free 1-860-656-9428. For other worldwide sales office telephone numbers and a full address list, please go to: <http://www.hexcel.com/contact/salesoffice>

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