Cumberland Additive, Inc.
Nickel Alloy 718 Datasheet

Cumberland Additive is an experienced additive manufacturing partner, capable of meeting strict aerospace, oil & gas, defense and space requirements and rapid turnaround products.

Cumberland Additive offers full services to meet your immediate needs, ranging from:

- Additive design assistance
- Rapid printing
- Thermal treatment / HIP
- CNC and surface (ID & OD) finishing
- Inspection (FPI, X-ray, digital CT)
- Metrology & digital scanning

We offer 718 production in accordance with ASTM F3055 and specific customer requirements. Additional mechanical and chemical property data is available upon request. The information in this document is for reference only.

Typical Tensile Properties[1]

		Room Temperature		Elevated Temperature	
		CAI [2]	AMS Min.[3]	CAI [4]	AMS Min.[5]
Property	Orientation[6]	ksi (MPa)		ksi (MPa)	
Ultimate Tensile Strength	XY	198 (1,367)	185 (1,276)	161 (1,112)	145 (1,000)
	Z	195 (1,345)	185 (1,276)	159 (1,093)	145 (1,000)
Tensile Yield Strength	XY	161 (1,107)	150 (1,034)	135 (933)	125 (862)
	Z	158 (1,086)	150 (1,034)	133 (916)	125 (862)
		[%]			
Elongation at Failure	XY	22	12	21	12
	Z	23	12	21	12

[1] The SLM 280 and EOS 280 produce comparable properties. The data shown is representative of both systems.
[2] Specimens received CAI best practice stress relief, HIP, solution treatment, and double age thermal cycles and were machined prior to testing.
[3] Minima specified for AMS 5663N and AMS 5596M
[4] Specimens received CAI best practice stress relief, HIP, solution treatment, and double age thermal cycles and were machined prior to testing at 600°C.
[5] Minima specified for AMS 5663N and AMS 5596M at 650°C
[6] XY: in build plane, Z: in build direction

Machine Options

Vendor and Model	Machine Type	Approximate Build Envelope
SLM 280	Laser powder bed fusion using two lasers	10.9 x 10.9 x 12 in^3 275 x 275 x 305 mm^3
EOS 280	Laser powder bed fusion	9.8 x 9.8 x 10.5 in^3 250 x 250 x 267 mm^3

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For more information please contact or visit us at:
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Cumberland Additive, Inc.
Ti-6Al-4V Datasheet

Cumberland Additive is an experienced partner in additive manufacturing, capable of meeting strict aerospace requirements as well as quick turnaround products.

Cumberland Additive offers full services to meet your immediate needs, ranging from:

- Additive design assistance
- Rapid printing
- Thermal treatment / HIP
- CNC and surface (ID & OD) finishing
- Inspection (FPI, X-ray, digital CT)
- Metrology & digital scanning

We offer Ti-6Al-4V production in accordance with ASTM F2924 and specific customer requirements. Additional mechanical and chemical property data is available upon request. The information in this document is for reference only.

Typical Tensile Properties[1,2]

		SLM 280HL	Arcam Q20+	AMS 4999
Property	Orientation[3]	ksi (MPa)		
Ultimate Tensile Strength	XY	147 (1,013)	142 (977)	129 (889)
	Z	142 (979)	150 (1,032)	124 (855)
Tensile Yield Strength	XY	133 (919)	127 (875)	116 (800)
	Z	124 (855)	136 (936)	111 (765)
		[%]		
Elongation at Failure	XY	15	15	6
	Z	15	17	5

[1] Specimens received CAI best practice stress relief and HIP thermal cycles and were tested in the machined condition.
[2] Specimens tested at room temperature
[3] XY: in build plane, Z: in build direction

Machine Options

Vendor and Model	Machine Type	Approximate Build Envelope
SLM 280HL	Laser powder bed fusion[1] using two lasers	10.9 x 10.9 x 12 in^3 275 x 275 x 305 mm^3
Arcam Q20	Electron beam powder bed fusion[2]	13.7 Ø x 15 in^3 348 Ø x 381 mm^3

[1] Laser powder bed fusion is ideal for parts with fine feature resolution and small internal passages.
[2] Electron beam powder bed fusion is ideal for applications that require lower residual stress and post processing.

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