

# MATERIAL SPECIFICATIONS

## FR-109

### HIGHLIGHTS

- Paintable grade fire retardant nylon 11
- Only LS material certified to pass the FAR 25.853 60 second vertical burn requirement
- Fire retardancy is increased to overcome flammability of certain paints
- Parts are approved for end use production applications

### APPLICATIONS

- Automotive and aerospace production
- Housing and enclosure assemblies
- Complex thin wall geometries requiring strength and accuracy
- Ideal for low to mid volume production applications

### TYPICAL PHYSICAL PROPERTIES

PROPERTY	TEST METHOD	U.S. STANDARD	METRIC
Colour/Appearance	Visual	White	White
Bulk Density	ASTM D1895	0.26 oz/in <sup>3</sup>	0.45 g/cm <sup>3</sup>
Average Particle Size (D50)	Laser Diffraction	0.004 inches	95 microns
Particle Size Range (D10D90)	Laser Diffraction	0.002 0.006 inches	45 151 microns
Sintered Part Density	ASTM D792	0.618 oz/in <sup>3</sup>	1.07 g/cm <sup>3</sup>
Heat Deflection Temperature	ASTM D648	158°F @ 264 psi	70°C @ 1.82 MPa
Heat Deflection Temperature	ASTM D648	367°F @ 66 psi	186°C @ 0.45 MPa
Ultimate Tensile Strength (XY)	ASTM D638	6,700 psi	46 MPa
Tensile Modulus (XY)	ASTM D638	202,000 psi	1,392 MPa
Flexural Modulus (XY)	ASTM D790	195,000 psi	1,345 MPa
Elongation at Break (XY)	ASTM D638	34%	34%
Izod Impact Strength Notched (XY)	ASTM D256	1.3 ftlb/in	69 J/m
Izod Impact Strength Unnotched (XY)	ASTM D256	3.2 ftlb/in	144 J/m
Flammability, 12 Second Vertical Burn	FAR 25.853	Pass	Pass
Flammability, 60 Second Vertical Burn	FAR 25.853	Pass	Pass

For reference use only. Actual properties may vary significantly from those listed above based on processing parameters, operating conditions and end use applications. The above properties were based on virgin ALM PA FR-109 using normal processing parameters on a 2500+ platform as outlined in the ALM Material Processing Guide. Advanced Laser Materials, LLC makes no warranties of materials for any application, nor does it make a warranty of any type, expressed or implied, but not limited to, the warranties of merchantability for a particular purpose.



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