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Kevlar (Aramid) Fiber

Aramid is light and tough: Kevlar 49 is 1.44 g/cm³ with about 3,000 MPa (435 ksi) yarn strength.

Typical yarn properties (DuPont Table II-1)

Property	Kevlar 29	Kevlar 49
Density	0.052 lb/in³ (1.44 g/cm³)	0.052 lb/in³ (1.44 g/cm³)
Yarn tensile strength	424,000 psi (2,920 MPa)	435,000 psi (3,000 MPa)
Yarn tensile modulus	10.2 Msi (70,500 MPa)	16.3 Msi (112,400 MPa), converted
Elongation at break	3.6%	2.4%
Impregnated strand strength	525,000 psi (3,600 MPa)	525,000 psi (3,600 MPa)
Impregnated strand modulus	12.0 Msi (83,000 MPa)	18.0 Msi (124,000 MPa)
Moisture, equilibrium from bone-dry	4.5%	3.5%
Decomposition in air	800–900 °F (427–482 °C)	800–900 °F (427–482 °C)
Recommended long-term maximum in air	300–350 °F (149–177 °C)	300–350 °F (149–177 °C)

A Kevlar fabric

Fabric	Weave	Weight	Thickness	Count per in	Breaking strength
BGF aramid 195 denier, plain weave (listed Style 120)	Plain	1.8 oz/yd² (61 g/m², converted)	0.0039 in (0.10 mm)	34 × 34	200 / 200 lbf/in

Key points

- **Yarn data, not laminate data.**
- **Heat.** DuPont warns tensile properties drop at or above 300–350 °F for extended periods.
- **Moisture.** The fiber properties are virtually unaffected by moisture, but the part still must be sealed against water (FAA).

SOURCES · DuPont, Kevlar Aramid Fiber Technical Guide, Section II, Table II-1 and thermal properties · FAA-H-8083-31B, AMT Handbook — Airframe, Volume 1, Chapter 7 · BGF Industries aramid data sheet, Kevlar 120

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 Educational reference only, not approved data. Always consult the applicable SRM, AMM, or AC 43.13-1B and your certifying authority.