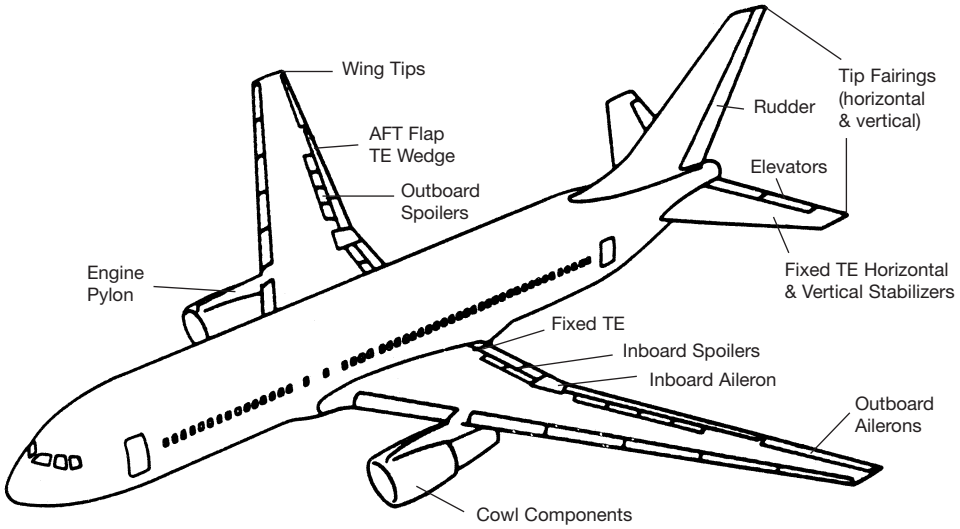
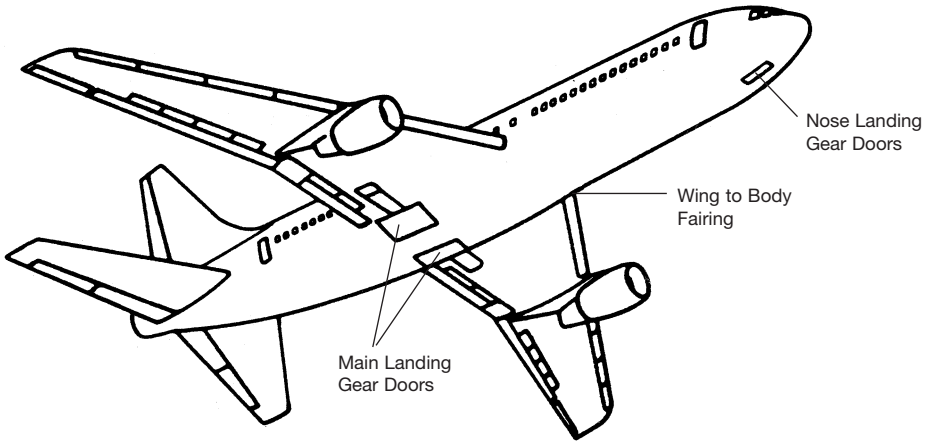
Typical Areas for Use of Thorstrand™ Prepregs

Thorstrand™ prepregs will be used in several different areas on aircraft where the material's capacities to conduct heat and electrical charges complement its structural properties.





Description

Thorstrand™ TEF7 is an electrically and thermally conductive aluminized E-glass structural fabric. This fabric construction was designed specifically to provide for the protection of nonconductive composite structure against the damaging effects of a direct lightning strike. Independent testing labs have confirmed that TEF7 fabric can prohibit penetration of a 200,000 ampere Zone 1 strike into composite sublayers.

Due to the high weave density of TEF7, the fabric provides good electromagnetic shielding, even at short wavelengths. TEF7 has excellent drapability, allowing for the co-curing of TEF7 with other composites in the layup.

Applications

Zone 1 direct strike (200,000 amperes) protection

Boeing 757	Horizontal stabilizer tips
Cessna Citation 3	Wing tips, radome, engine nacelles, vertical stabilizer tip
Canadair Challenger	Engine nacelles
Lockheed C5-A/B	Radome plug
De Havilland -7/-8	Inboard fixed leading edge, wing tips, nose plug
Boeing Vertol CH-46	Rotor blades
Kaman	Rotor blades

Zone 2 swept stroke (100,000 amperes) protection, antenna groundplane and P-static dissipation

Cessna Citation 3	Access doors, wing-to-body fairing
Swearing Metroliner	Wing-to-body fairing
De Havilland -7/-8	Wing-to-body fairing, access doors
General Dynamics F16	Fairings

Non-Aerospace Applications

Various commercial microwave antenna/reflectors for the home entertainment and telecommunications markets, and various shelter applications that require EMI shielding properties.

Physical Properties

Construction	32 x 30
Weave style	5 harness satin
Fiber type	MBAssociates dual 45-count Metafil G™ aluminized E-glass filaments per yarn
Nominal weight	8.5 oz/yd^2
Nominal thickness	11.0 mils
Minimum aluminum content	28.5% by weight
Nominal density	2.6 gm/cc

Electrical Properties

Nominal resistivity	5–10 ohm/ft^2
Shielding effectiveness, dB	2.0 GHz 63–59
	4.0 GHz 62–58
	6.0 GHz 59–58
	8.0 GHz 54–59
	10.0 GHz 60–46
	12.0 GHz 48–47
	14.0 GHz 52–51
	16.0 GHz 50–46
	18.0 GHz 52–51

Thermal Properties

Coefficient of thermal expansion (CTE)	10.7 x 10^{-6} in/in/°F
Thermal conductivity	32.4 BTU-in/HR-FT^2°F

Mechanical Properties

Nominal dry fabric tensile strength, warp	106 lb/in
Nominal dry fabric tensile strength, fill	61 lb/in
Laminate properties, 250°F (121ºC) epoxy (F155) at nominal 42% WRC	
Tensile strength (RT)	24.0 ksi
Tensile modulus (RT)	2.1 msi
Compressive strength (RT)	50.0 ksi
Compressive modulus (RT)	2.1 msi
Laminate properties, 350°F (177ºC) epoxy (F161) at nominal 42% WRC	
Tensile strength (RT)	12.0 ksi
Tensile modulus (RT)	1.6 msi
Compressive strength (RT)	35.0 ksi
Compressive modulus (RT)	1.3 msi

Specifications

Boeing Company	BMS 8-278 Rev. B
Brunswick	BMS 109044 Rev. 3
Brunswick	BMS 109048 Rev. E
De Havilland	DHMS PI.38B Amend. 2
Kaman	KPS 365 Rev. 3
LTV	207-7-466A

Available Forms

Standard width	38 in
Standard roll length	50 yd
Fabric forms	Greige (weaving binder intact on fabric)
	Prefinished (weaving binder removed, epoxy prefinish applied)
	Impregnated

Important

For more Information

Hexcel is a leading worldwide supplier of composite materials to aerospace and other demanding industries. Our comprehensive product range includes:

- Carbon Fiber
- RTM Materials
- Honeycomb Cores
- Continuous Fiber Reinforced Thermoplastics
- Carbon, Glass, Aramid and Hybrid Prepregs
- Structural Film Adhesives
- Honeycomb Sandwich Panels
- Special Process Honeycombs
- Reinforced Fabrics

For US quotes, orders and product information call toll-free 1-800-688-7734. For other worldwide sales office telephone numbers and a full address list please click here: **http://www.hexcel.com/contact/salesoffices**.