

TLE

**Low CTE Value
Controlled Dimensional Stability
Low Dissipation Factor
Low & Stable Dielectric Constant
High Flexural Strength
UL 94 V-O Rating**

TACONIC

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TLE

APPLICATIONS

Microwave Radios

High Speed Digital Work Stations

Satellite Antenna Systems

Passive Components

High Layer Count MLBs

High Speed Chip Test MLBs

Taconic has over 35 years of experience coating fiberglass fabric with PTFE (polytetrafluoroethylene). This enables Taconic to manufacture copper clad PTFE/woven glass laminates with exceptionally well controlled electrical and mechanical properties.

Taconic TLE laminates are engineered to provide electrical, and mechanical properties to meet the requirements of complex microwave and high speed digital applications. The low Z-axis CTE of TLE laminates provides excellent plated through hole reliability. The low thermal expansion properties in the X and Y plane ensure high reliability in surface mount applications. The dielectric constant (Dk) exhibits minimal change over temperature. The Dk is typically offered at 2.95, with a tolerance of $\pm .05$.

TLE laminates can be sheared, drilled, milled, and plated using standard methods for PTFE/woven fiberglass materials. The laminates are dimensionally stable, and exhibit virtually no moisture absorption during fabrication processes.

TLE laminates are generally ordered clad on one or both sides with 1/2, 1, or 2 oz. electrodeposited copper foil. Contact our Customer Service Department for alternate claddings.

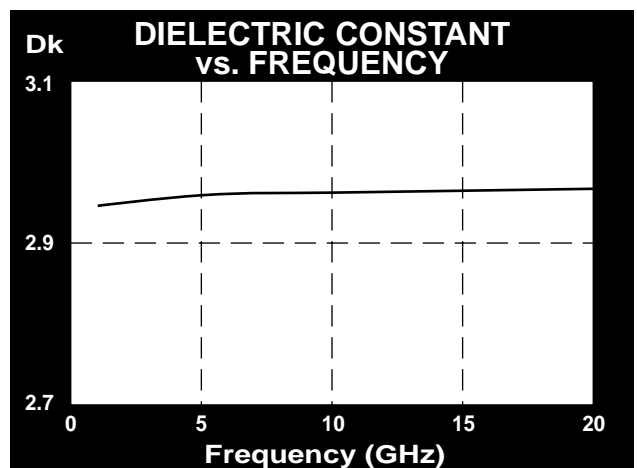
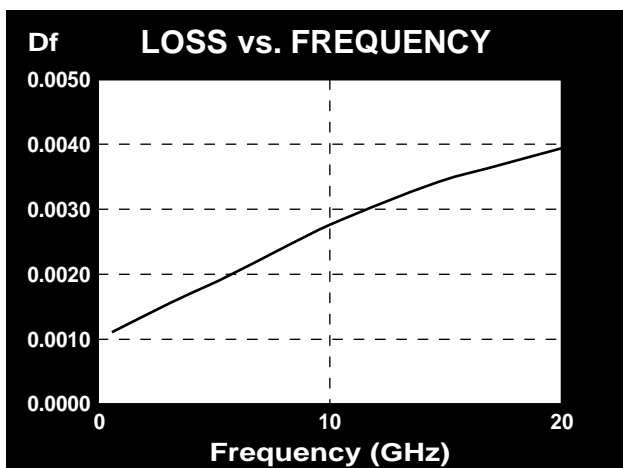
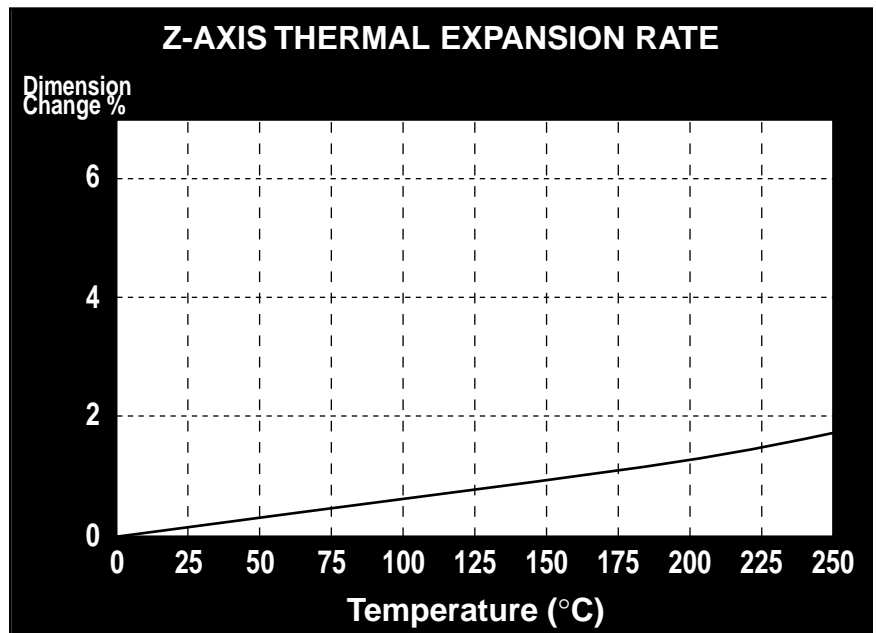
TLE laminates are tested in accordance with IPC-TM 650. A Certificate of Compliance containing actual test data accompanies each shipment.

See "How to Order" on back page for a complete product listing.

TLE-95 TYPICAL VALUES

Property	Test Method	Units	Value	Units	Value
Dielectric Constant @ 10 GHz	IPC-TM 650 2.5.5.5		2.95		2.95
Dissipation Factor @ 10 GHz	IPC-TM 650 2.5.5.5		0.0028		0.0028
Moisture Absorption	IPC-TM 650 2.6.2.1	%	<0.02	%	<0.02
Dielectric Breakdown	IPC-TM 650 2.5.6	kV	>60	kV	>60
Volume Resistivity	IPC-TM 650 2.5.17.1	Mohm/cm	10 ⁷	Mohm/cm	10 ⁷
Surface Resistivity	IPC-TM 650 2.5.17.1	Mohm	10 ⁷	Mohm	10 ⁷
Arc Resistance	IPC-TM 650 2.5.1	seconds	>180	seconds	>180
Flexural Strength Lengthwise	IPC-TM 650 2.4.4	lbs./in.	>35,000	N/mm ²	>241
Flexural Strength Crosswise	IPC-TM 650 2.4.4	lbs./in.	>30,000	N/mm ²	>207
Peel Strength (1oz copper)	IPC-TM 650 2.4.8	lbs./linear in.	12.0	N/mm	2.1
Thermal Conductivity	ASTM F 433	W/m/K	0.20	W/m/K	0.20
x-y CTE	ASTM D 3386 (TMA)	ppm/°C	9-12	ppm/°C	9-12
z CTE	ASTM D 3386 (TMA)	ppm/°C	70	ppm/°C	70
UL-94 Flammability Rating	UL-94		V-0		V-0

Type	Dk
TLY-5A	2.17
TLY-5	2.20
TLY-3	2.33
TLT-0 TLX-0	2.45
TLT-9 TLX-9	2.50
TLT-8 TLX-8	2.55
TLT-7 TLX-7	2.60
TLT-6 TLX-6	2.65
TLE-95	2.95
TLC-27	2.75
TLC-30	3.00
TLC-32	3.20
RF-30	3.00
RF-35	3.50
RF-60	6.15
CER-10	10



How to Order

Designation	Dielectric Constant	Dielectric Thickness	Dielectric Thickness
TLE - 95	3.00 +/- .05	.0052"	0.13mm
TLE - 95	2.95 +/- .05	.0100" - .0190"	0.25mm – 0.48mm
		.0200" - .0300"	0.50mm – 0.76mm
		≥ .0310"	≥ 0.80mm

Standard sheet size is 36" x 48" (914mm x 1200mm). Please contact our Customer Service Department for the availability of other sizes and claddings.

TLE can be ordered with the following electrodeposited copper:

Designation	Weight	Copper Thickness	Copper Thickness
CH	1/2 oz./sq. ft.	~ .0007"	~18 µm
C1	1 oz./sq. ft.	~ .0014"	~ 35 µm
C2	2 oz./sq. ft.	~ .0028"	~ 70 µm

Panels may be ordered cut to size

Typical Panel Sizes	
12" x 18"	304mm x 457mm
16" x 18"	406mm x 457mm
18" x 24"	457mm x 610mm
16" x 36"	406mm x 914mm
24" x 36"	610mm x 914mm
18" x 48"	457mm x 1220mm

An example of our part number is: TLE-95-0100-CH/CH-18" x 24" (TLE-95-0100-CH/CH-457mm x 610mm)

TACONIC
ADVANCED DIELECTRIC DIVISION

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