

TLC

Low Cost
Low Dissipation Factor
Tightly Controlled Dielectric Constant
Exceptional Dimensional Stability
High Flexural Strength
UL 94 V-0 Rating

TACONIC

An ISO 9001:2000 Registered Company
Petersburgh, NY: Tel: 800-833-1805 Fax: 518-658-3988
Europe: Tel: +353-44-9395600 Fax: +353-44-9344369 Asia: Tel: +82-31-704-1858 Fax: +82-31-704-1857
www.taconic-add.com

APPLICATIONS

LNBS
PCS/PCN Large Format
Antennas
Power Amplifiers
Passive Components

TLC

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 controlled electrical and mechanical properties.

Taconic TLC laminates are engineered to provide a cost effective substrate. TLC laminates are suitable for a wide range of microwave applications. TLC laminates offer far superior electrical performance compared to thermoset laminates (e.g. FR-4, PPO, BT, polyimide, and cyanate ester). The construction of the laminate provides exceptional mechanical stability. The dielectric constant (Dk) is typically offered at 3.2 +/- 0.05.

TLC 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.

TLC laminates are generally ordered clad on both sides with 1/2, 1 or 2 oz. electrodeposited copper.

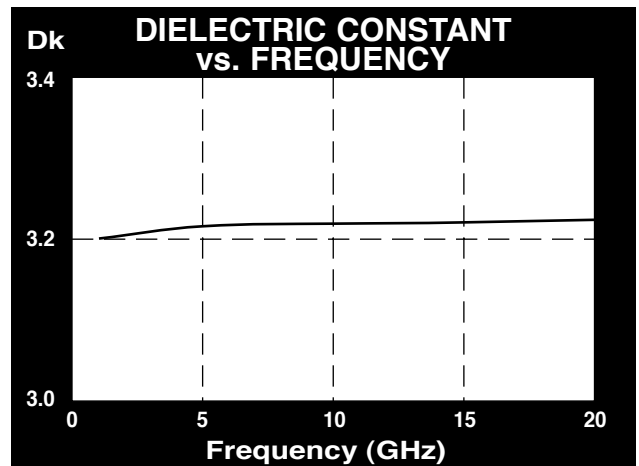
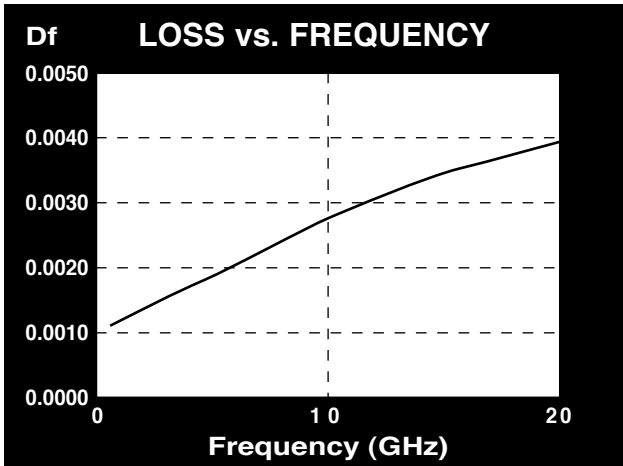
TLC laminates exhibit flammability of V-0 and are tested in accordance with IPC-TM 650. A certificate of conformance containing lot-specific data accompanies each shipment.

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

TLC Typical Values

Property	Test Method	Unit	Value	Unit	Value
Dielectric Constant @ 10 GHz	IPC-TM-650 2.5.5.5		3.20		3.20
Dissipation Factor @ 10 GHz	IPC-TM-650 2.5.5.5		0.0030		0.0030
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 (MD)	IPC-TM-650 2.4.4	psi	>40,000	N/mm ²	>276
Flexural Strength (CD)	IPC-TM-650 2.4.4	psi	>35,000	N/mm ²	>241
Peel Strength (1 oz ED)	IPC-TM-650 2.4.8	lbs/linear inch	12.0	N/mm	2.1
Thermal Conductivity	ASTM F 433	W/m/K	0.24	W/m/K	0.24
CTE (x-y)	ASTM D 3386 (TMA)	ppm/°C	9-12	ppm/°C	9-12
CTE (z)	ASTM D 3386 (TMA)	ppm/°C	70	ppm/°C	70
Outgassing (% TML)	ASTM E 595*	%	0.01	%	0.01
Outgassing (% CVCM)	ASTM E 595*	%	0.00	%	0.00
Outgassing (% WVR)	ASTM E 595*	%	0.01	%	0.01
Flammability Rating	UL 94		V-0		V-0

*As reported by NASA. See http://outgassing.nasa.gov/og_disclaimer.html.



All reported values are typical and should not be used for specification purposes. In all instances, the user shall determine suitability in any given application.

How To Order

Dielectric Constant	Dielectric Constant	Typical Thicknesses ¹			
TLC-27	2.75 +/- 0.05	0.0145"		0.37 mm	
TLC-30	3.00 +/- 0.05	0.0200"	0.0620"	0.51 mm	1.58 mm
		0.0300"	0.0930"	0.76 mm	2.36 mm
		0.0310"	0.1250"	0.79 mm	3.18 mm
TLC-32	3.20 +/- 0.05	0.0450"	0.1870"	1.14 mm	4.75 mm
		0.0600"	0.2500"	1.52 mm	6.35 mm

Available Sheet Sizes ²	
12" x 18"	304 mm x 457 mm
16" x 18"	406 mm x 457 mm
18" x 24"	457 mm x 610 mm
16" x 36"	406 mm x 914 mm
24" x 36"	610 mm x 914 mm
Long Laminates	
36" x 60"	914 mm x 1526 mm
36" x 76"	914 mm x 1930 mm
36" x 102"	914 mm x 2590 mm

¹Other thicknesses may be available. Please call for availability.

²Our standard sheet size is 36" x 48" (914 mm x 1220 mm). Please contact our customer service department for availability of other sizes.

Available Copper Cladding						
Designation	Weight	Copper Thickness		R _{MS} Treated Side		Description
RH	1/2 oz / ft ²	~0.0007"	~18 µm	16 µin	0.4 µm	Rolled annealed
R1	1 oz / ft ²	~0.0014"	~35 µm	11 µin	0.3 µm	Rolled annealed
CLH	1/2 oz / ft ²	~0.0007"	~18 µm	13 µin	0.3 µm	Reverse treated / Electrodeposited
CL1	1 oz / ft ²	~0.0014"	~35 µm	13 µin	0.3 µm	Reverse treated / Electrodeposited
CVH (CH)	1/2 oz / ft ²	~0.0007"	~18 µm	27 µin	0.7 µm	Very low profile / Electrodeposited
CV1 (C1)	1 oz / ft ²	~0.0014"	~35 µm	25 µin	0.6 µm	Very low profile / Electrodeposited
C2	2 oz / ft ²	~0.0028"	~70 µm	77 µin	2.0 µm	Electrodeposited

Heavy metal claddings (aluminum, brass & copper) may also be available upon request. Please call for information.

An example of our part number is: **TLC-32-0310-CV1/CV1 - 18" x 24" (457 mm x 610 mm)**

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