TLP Lowest Loss, High Volume Laminates

TLP laminates are constructed with a woven matrix of fiberglass fabric coated with PTFE that is more mechanically stable and has a more uniform dielectric constant than traditional non-woven products. The exceptionally low dissipation factor extends the usefulness of this product to 35 GHz and above.

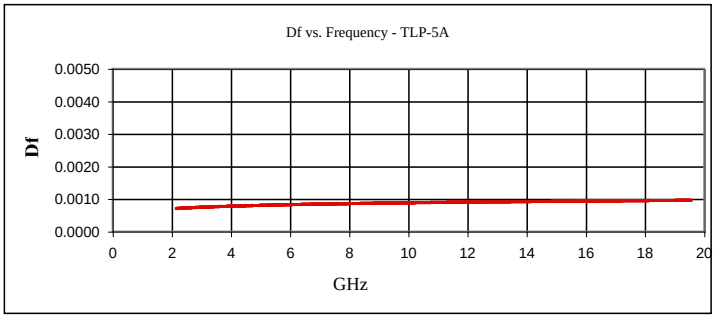
TLP laminates offer a cost effective solution for low loss antenna and radar applications. These laminates can be sheared, drilled, milled and plated using the accepted methods for PTFE/woven fiberglass laminates. The laminates are dimensionally stable and are resistant to the solvents and reagents used during fabrication.

Taconic is a world leader in RF laminates and high speed digital materials, offering a wide range of high frequency laminates and prepregs. These advanced materials are used in the fabrication of antennas, multilayer RF and high speed digital boards, interconnections and devices.

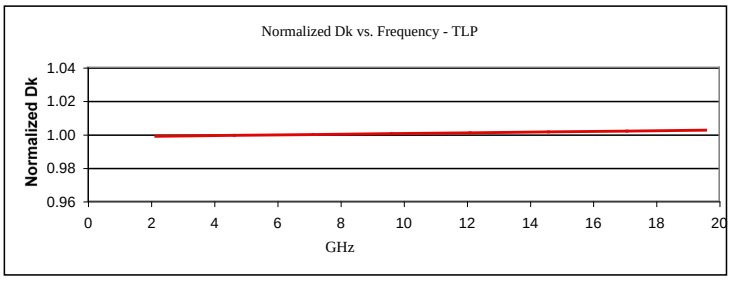
Benefits & Applications:

- **Dimensionally Stable**
- **Low Loss**
- **High Peel Strength**
- **Low Moisture Absorption**
- **Uniform, Consistent Dk**

- **Automotive Radar**
- **Low Loss Antennas**
- **Collision Avoidance Systems**



TLP exceeds PIM requirements in PCBs of -153 dBc (measured between 880 and 960 MHz, between 1710 and 1880 MHz and between 1920 and 2170 MHz at 20 W power) with CL1/CL1 cladding when processed with today's state-of-the-art processes and process parameters.



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TLP Lowest Loss, High Volume Laminates

TLP Typical Values					
Property	Test Method	Unit	Value	Unit	Value
Dk @ 10 GHz	IPC-650 2.5.5.5		2.17 - 2.33 +/-0.03		2.17 - 2.33 +/-0.03
Df @ 10 GHz	IPC-650 2.5.5.5		0.0009		0.0009
Moisture Absorption	IPC-650 2.6.2.1	%	<0.02	%	<0.02
Dielectric Breakdown	IPC-650 2.5.6	Kv	>60	Kv	>60
Volume Resistivity	IPC-650 2.5.17.1	Mohms/cm	10^7	Mohms/cm	10^7
Surface Resistivity	IPC-650 2.5.17.1	Mohms	10^7	Mohms	10^7
Arc Resistance	IPC-650 2.5.1	seconds	>180	seconds	>180
Flex strength (MD)	IPC-650 2.4.4	lbs./inch	>12,000	N/mm^2	>83
Flex strength (CD)	IPC-650 2.4.4	lbs./inch	>10,000	N/mm^2	>69
Peel Strength (CH)	IPC-650 2.4.8	lbs./linear inch	10.0	N/mm	1.75
T_d (2% Wt. Loss)	IPC-650-2.4.24.6 (TGA)	°F	>932	°C	>500
Melt Point		°F	620	°C	327
Thermal Conductivity	ASTM F 433	W/M*K	0.22	W/M*K	0.22
CTE (X-Y axis)	ASTM D 3386 (TMA)	ppm/°C	20	ppm/°C	20
CTE (Z axis)	ASTM D 3386 (TMA)	ppm/°C	280	ppm/°C	280

Designation	Dk
TLP-5A	2.17 +/-0.03
TLP-5	2.20 +/- 0.03
TLP-3	2.33 +/- 0.03

Typical Thicknesses[1]	
Inches	mm
0.0050	0.13
0.0100	0.25
0.0200	0.51
0.0310	0.78

Available Sheet Sizes[2]	
Inches	mm
12 x 18	304 x 457
16 x 18	406 x 457
18 x 24	457 x 610
16 x 36	406 x 914
24 x 36	610 x 914
18 x 48	457 x 1220

[1]Other thicknesses may be available. Please call for information.
[2]Our standard sheet size is 36" x 48" (457 mm x 610 mm). Please contact our customer service department for availability of other sizes.

Available Copper Cladding						
Designation	Weight	Copper Thickness		R_{MS} Treated Side		Description
CLH	½ oz / ft^2	~0.0007"	~18 µm	18 µin	0.46 µm	Reverse treated/Electrodeposited
CL1	1 oz / ft^2	~0.0014"	~35 µm	16 µin	0.41 µm	Reverse treated/Electrodeposited
CVH (CH)	½ oz / ft^2	~0.0007"	~18 µm	19 µin	0.50 µm	Very low profile/Electrodeposited
CV1 (C1)	1 oz / ft^2	~0.0014"	~35 µm	25 µin	0.64 µm	Very low profile/Electrodeposited

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

RoHS WEEE Compliant

An example of our part number is: TLP-005-CVH/CVH - 18" x 24" (457 mm x 610 mm)

rev. 8/13

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.