

## TLP Lowest Loss, High Volume Laminates

**TLP** laminates are constructed with a woven matrix of fiber-glass 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.

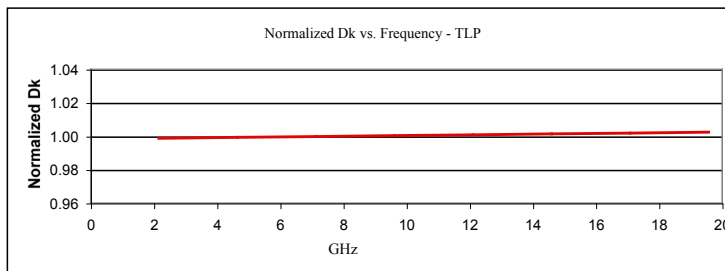
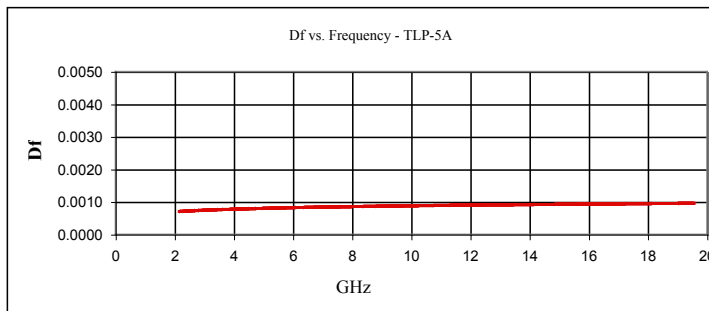
TLP laminates offer a cost effective solution for low loss antenna and radar applications. These laminates can be sheared, drilled, milled and plated using the accepted methods for PTFE/woven fiberglass laminates. The laminates are dimensionally stable and are resistant to the solvents and reagents used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

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

### Benefits & Applications:

- Excellent PIM values in PCBs (measured at lower than -160 dBc\*)
  - Dimensionally Stable
  - Low Loss
  - High Peel Strength
  - Low Moisture Absorption
  - Uniform, Consistent Dk
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- Automotive Radar
  - Low Loss Antennas
  - Collision Avoidance Systems

\*Measurement using manufactured PCB coupon with 20 watts per channel @ 800 and 1800 MHz.



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An ISO 9001 Registered Company

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Commercial and Government Entity (CAGE) Code: 1C6Q9

# 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 <sup>7</sup>	Mohms/cm	10 <sup>7</sup>
Surface Resistivity	IPC-650 2.5.17.1	Mohms	10 <sup>7</sup>	Mohms	10 <sup>7</sup>
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 <sup>2</sup>	>83
Flex strength (CD)	IPC-650 2.4.4	lbs./inch	>10,000	N/mm <sup>2</sup>	>69
Peel Strength (CH)	IPC-650 2.4.8	lbs./linear inch	10.0	N/mm	1.75
T <sub>d</sub> (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 <sup>1</sup>	
Inches	mm
0.0050	0.13
0.0100	0.25
0.0200	0.51
0.0310	0.78

Available Sheet Sizes <sup>2</sup>	
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

<sup>1</sup>Other thicknesses may be available. Please call for information.

<sup>2</sup>Our standard sheet size is 36" x 48" (457 mm x 610 mm). Please contact our customer service department for availability of other sizes.

Please see our Product Selector Guide for information on available copper cladding.

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



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.