

## TLT Low Loss RF/Microwave Laminates

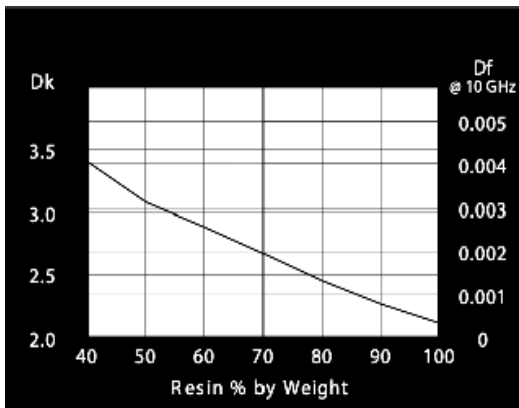
TLT laminates are designed for applications where low loss and excellent mechanical and thermal properties are a critical requirement. These laminates are ideal for radar systems, phased array antennas, mobile communication systems, microwave test equipment, microwave transmission devices and RF components.

TLT 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.

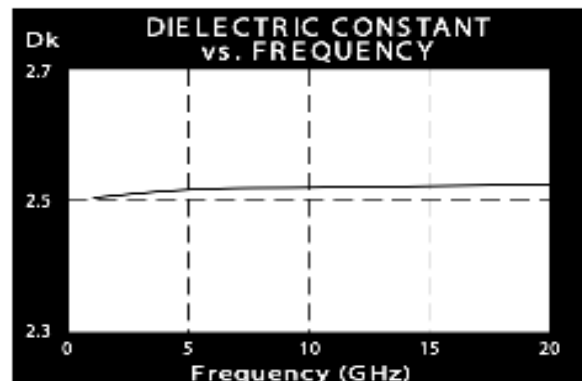
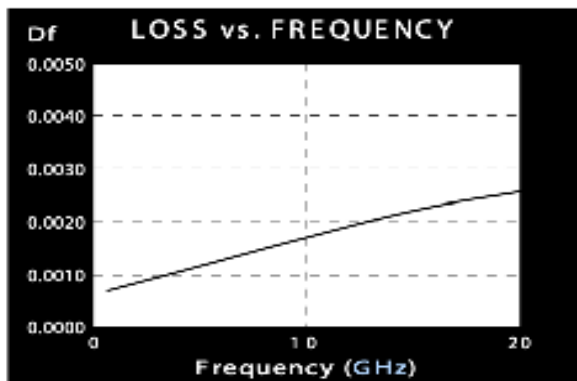
TLT laminates are generally ordered clad on both sides.

### Benefits & Applications:

- Excellent Mechanical & Thermal Properties
- Low Dissipation Factor
- Low & Stable Dielectric Constant
- UL 94 V-0 Rating



- LNAs, LNBs and LNCs
- PCS/PCN Large Format Antennas
- High Power Amplifiers
- Passive Components



# TLT Low Loss RF/Microwave Laminates

| TLT Typical Values      |                   |          |                 |                   |                 |
|-------------------------|-------------------|----------|-----------------|-------------------|-----------------|
| Property                | Test Method       | Unit     | Value           | Unit              | Value           |
| Dk @ 1 MHz              | IPC-650 2.5.5.3   |          | 2.50            |                   | 2.50            |
| Df @ 1 MHz              | IPC-650 2.5.5.53  |          | 0.0006          |                   | 0.0006          |
| 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     | psi      | >23,000         | N/mm <sup>2</sup> | >159            |
| Flex Strength (CD)      | IPC-650 2.4.4     | psi      | >19,000         | N/mm <sup>2</sup> | >131            |
| Peel Strength (1 oz ED) | IPC-650 2.4.8     | lbs/in   | 12              | N/mm              | 2.1             |
| Thermal Conductivity    | ASTM F 433        | W/M*K    | 0.19            | W/M*K             | 0.19            |
| CTE (X-Y axis)          | ASTM D 3386 (TMA) | ppm/°C   | 21-23           | ppm/°C            | 21-23           |
| CTE (Z axis)            | ASTM D 3386 (TMA) | ppm/°C   | 215             | ppm/°C            | 215             |
| Flammability Rating     | UL 94             |          | V-0             |                   | V-0             |

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.

| Designation | Dk          |
|-------------|-------------|
| TLT-0       | 2.45 ± 0.05 |
| TLT-9       | 2.50 ± 0.05 |
| TLT-8       | 2.55 ± 0.05 |
| TLT-7       | 2.60 ± 0.05 |
| TLT-6       | 2.65 ± 0.05 |

| Typical Thicknesses <sup>1</sup> |             |
|----------------------------------|-------------|
| Inches                           | mm          |
| 0.0014 - 0.1250                  | 0.04 - 3.18 |

| Available Sheet Sizes <sup>2</sup> |           |
|------------------------------------|-----------|
| Inches                             | mm        |
| 12 x 18                            | 305 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 |

<sup>1</sup> Please call for availability of additional thicknesses.

<sup>2</sup> Standard sheet size is 36" x 48" (457 mm x 610 mm). Please call for availability of other sizes.

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

An example of our part number is: **TLT-9-0310-CV1/CV1 - 18" x 24" (457 mm x 610 mm)**