

# Taconic High-Performance Material Properties

Part #	Composition	DK	DF	Volume Resistivity Mohm/cm	Surface Resistivity Mohm	Flexural Strength lbs/in <sup>2</sup>		Moisture Absorption %	Thermal Conductivity W/m/K	Coefficient of Thermal Expansion ppm/°C			Peel Strength lbs/in 1 oz Cu	UL Rating
						Lengthwise	Crosswise			x	y	z		
TLY-5A	PTFE Woven Glass	2.17 <sup>(a)</sup>	0.0009 <sup>(a)</sup>	10 <sup>7</sup>	10 <sup>7</sup>	>12,000	>10,000	<0.02	0.22	20	20	280	12.0	94-V0
TLY-5	PTFE Woven Glass	2.20 <sup>(a)</sup>	0.0009 <sup>(a)</sup>	10 <sup>7</sup>	10 <sup>7</sup>	>12,000	>10,000	<0.02	0.22	20	20	280	12.0	94-V0
TLY-3	PTFE Woven Glass	2.33 <sup>(a)</sup>	0.0012 <sup>(a)</sup>	10 <sup>7</sup>	10 <sup>7</sup>	>12,000	>10,000	<0.02	0.22	20	20	280	12.0	94-V0
HT 1.5	Bonding Film	2.35	0.0025					0.005						
TLX-0	PTFE Woven Glass	2.45 <sup>(a)</sup>	0.0019 <sup>(a)</sup>	10 <sup>7</sup>	10 <sup>7</sup>	>23,000	>19,000	<0.02	0.14	9	12	140	12.0	94-V0
TLX-9	PTFE Woven Glass	2.50 <sup>(a)</sup>	0.0019 <sup>(a)</sup>	10 <sup>7</sup>	10 <sup>7</sup>	>23,000	>19,000	<0.02	0.14	9	12	140	12.0	94-V0
TLX-8	PTFE Woven Glass	2.55 <sup>(a)</sup>	0.0019 <sup>(a)</sup>	10 <sup>7</sup>	10 <sup>7</sup>	>23,000	>19,000	<0.02	0.14	9	12	140	12.0	94-V0
TLX-7	PTFE Woven Glass	2.60 <sup>(a)</sup>	0.0019 <sup>(a)</sup>	10 <sup>7</sup>	10 <sup>7</sup>	>23,000	>19,000	<0.02	0.14	9	12	140	12.0	94-V0
TLX-6	PTFE Woven Glass	2.65 <sup>(a)</sup>	0.0019 <sup>(a)</sup>	10 <sup>7</sup>	10 <sup>7</sup>	>23,000	>19,000	<0.02	0.14	9	12	140	12.0	94-V0
TLC-27	PTFE Woven Glass	2.75 <sup>(a)</sup>	0.0030 <sup>(a)</sup>	10 <sup>7</sup>	10 <sup>7</sup>	>40,000	>35,000	<0.02	0.24	9	12	70	12.0	94-V0
TLE-95	PTFE Woven Glass	2.95 <sup>(a)</sup>	0.0019 <sup>(a)</sup>	10 <sup>7</sup>	10 <sup>7</sup>	>35,000	>30,000	<0.02	0.20	9	12	70	12.0	94-V0
TLC-30	PTFE Woven Glass	3.00 <sup>(a)</sup>	0.0030 <sup>(a)</sup>	10 <sup>7</sup>	10 <sup>7</sup>	>40,000	>35,000	<0.02	0.24	9	12	70	12.0	94-V0
TacPreg TPG-30	Prepreg	3.00	0.0038					0.13						
TacLam TLG-30	PTFE Ceramic BT Woven Glass	3.00	0.0026	8.23 x 10 <sup>7</sup>	1.52 x 10 <sup>6</sup>	20,000	22,100	0.16	0.27	8	12	61	13	94-V0
RF-30	PTFE Ceramic Woven Glass	3.00 <sup>(b)</sup>	0.0014 <sup>(b)</sup>	1.26 x 10 <sup>9</sup>	1.46 x 10 <sup>8</sup>	>13,000	>9,000	<0.02	0.20	11	21	125	>10.0	94-V0
TSM-30	PTFE Ceramic Woven Glass	3.00 <sup>(c)</sup>	0.0015 <sup>(c)</sup>	2.5 x 10 <sup>8</sup>	5.6 x 10 <sup>7</sup>	>6,900	>6,000	0.03	0.27	23	28	78	8	94-V0
TLC-32	PTFE Woven Glass	3.20 <sup>(a)</sup>	0.0030 <sup>(a)</sup>	10 <sup>7</sup>	10 <sup>7</sup>	>40,000	>35,000	<0.02	0.24	9	12	70	12.0	94-V0
TacPreg TPG-32	Prepreg	3.20	0.0050					0.22						
TacLam TLG-32	PTFE Ceramic BT Woven Glass	3.20 <sup>(c)</sup>	0.0030 <sup>(c)</sup>	8.2 x 10 <sup>7</sup>	1.5 x 10 <sup>6</sup>	20,000	22,100	0.16	0.27	8	12	61	13	94-V0
TacLam TLG-34	PTFE Ceramic BT Woven Glass	3.38 <sup>(c)</sup>	0.0031 <sup>(c)</sup>	8.2 x 10 <sup>7</sup>	1.5 x 10 <sup>6</sup>	20,000	22,100	0.16	0.27	8	12	61	13	94-V0
TacPreg TPG-35	Prepreg	3.50	0.0050					0.13						
TacLam TLG-35	PTFE Ceramic BT Woven Glass	3.50 <sup>(c)</sup>	0.0030 <sup>(c)</sup>	8.2 x 10 <sup>7</sup>	1.5 x 10 <sup>6</sup>	20,000	22,100	0.16	0.27	8	12	61	13	94-V0
RF-35	PTFE Ceramic Woven Glass	3.50 <sup>(b)</sup>	0.0018 <sup>(b)</sup>	1.26 x 10 <sup>9</sup>	1.46 x 10 <sup>8</sup>	>22,000	>18,000	0.02	0.24	19	24	64	>10.0	94-V0
RF-35A	PTFE Ceramic Woven Glass	3.50 <sup>(b)</sup>	0.0025 <sup>(b)</sup>	1.77 x 10 <sup>8</sup>	2.3 x 10 <sup>7</sup>	>7,600	>12,300	0.04	0.35	8	10	29	12	94-V0
RF-35P	PTFE Ceramic Woven Glass	3.50 <sup>(b)</sup>	0.0025 <sup>(b)</sup>	5.0 x 10 <sup>8</sup>	3.5 x 10 <sup>7</sup>	>28,000	>16,000	0.03	0.27	15	15	110	>10.0	94-V0
RF-60A	PTFE Ceramic Woven Glass	6.15 <sup>(d)</sup>	0.0028 <sup>(a)</sup>	9.0 x 10 <sup>8</sup>	2.28 x 10 <sup>8</sup>	>18,300	>14,600	0.02	0.54	9	8	69	8.0	94-V0
CER-10 (0.0620)	PTFE Ceramic Woven Glass	10.0 <sup>(d)</sup>	0.0035 <sup>(a)</sup>	2.1 x 10 <sup>8</sup>	1.1 x 10 <sup>8</sup>	>16,500	>15,500	0.02	0.63	13	15	46	>5.0	94-V0

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. [www.iPCB.com](http://www.iPCB.com)

<sup>(a)</sup> Measured by IPC-TM-650 method 2.5.5.5 (stripline resonator) at 10 GHz

<sup>(b)</sup> Measured by IPC-TM-650 method 2.5.5.5.1 (modified stripline) at 1.9 GHz

<sup>(c)</sup> Measured by IPC-TM-650 method 2.5.5.5.1 (modified stripline) at 10 GHz

<sup>(d)</sup> Measured by IPC-TM-650 method 2.5.5.6 (full sheet resonant)

# Copper Cladding

Copper Designation	Surface Roughness R <sub>MS</sub> Treated side		Surface Roughness R <sub>MS</sub> Untreated side		Description	Thickness	
	Microinches	Microns	Microinches	Microns		Mils	Micrometers
RH	16	0.4	7	0.2	Rolled-Annealed 1/2 oz	0.7	17.5
R1	11	0.3	7	0.2	Rolled-Annealed 1 oz	1.4	35.0
CLH	13	0.3	20	0.5	Reverse treated Electrodeposited 1/2 oz	0.7	17.5
CL1	13	0.3	25	0.6	Reverse treated Electrodeposited 1 oz	1.4	35.0
CVH (CH)	27	0.7	11	0.3	Very Low Profile Electrodeposited 1/2 oz	0.7	17.5
CV1 (C1)	25	0.6	11	0.3	Very Low Profile Electrodeposited 1 oz	1.4	35.0
C2	77	2.0	8	0.2	Electrodeposited 2 oz	2.8	70.0

Omega Ply® and Gould Resistive foils available upon request. Please call for availability of other foils.

# Heavy Metal Cladding

The following heavy metal claddings are also available upon request. Please call for availability and specification information.\*

- Aluminum
- Copper
- Brass

\*Taconic's heavy metals are supplied in metric measurements only.

# Typical Sizes\*

Typical Size		Long Laminates		Cut Sizes	
36" x 48"	914mm x 1220mm	36" x 60"	914mm x 1524mm	12" x 18"	304mm x 457mm
		36" x 76"	914mm x 1930mm	16" x 18"	406mm x 457mm
		36" x 102"	914mm x 2590mm	18" x 24"	457mm x 610mm
				16" x 36"	406mm x 914mm
				24" x 36"	610mm x 914mm

\*Other sizes available upon request

# Available Thicknesses\*

Product	Available Thickness		Thickness Tolerance	
	(")	(mm)	(")	(mm)
TLY-3, 5, 5A	0.0050 (TLY-3,5)	0.13	+/- 0.0005	+/- 0.01
	0.0100	0.25	+/- 0.0007	+/- 0.02
	0.0150	0.38	+/- 0.0010	+/- 0.03
	0.0200	0.51	+/- 0.0015	+/- 0.04
	0.0250	0.64	+/- 0.0015	+/- 0.04
	0.0300	0.76	+/- 0.0020	+/- 0.05
	0.0310	0.79	+/- 0.0020	+/- 0.05
	0.0600	1.52	+/- 0.0020	+/- 0.05
	0.0620	1.58	+/- 0.0020	+/- 0.05
	0.0900	2.29	+/- 0.0030	+/- 0.08
	0.0930	2.36	+/- 0.0030	+/- 0.08
	0.1250	3.18	+/- 0.0035	+/- 0.09
	0.1870	4.75	+/- 0.0050	+/- 0.13
	TacBond HT 1.5	0.0015	0.04	
TLX (TLT)-6, 7, 8, 9, 0	0.0035	0.09	+/- 0.00025	+/- 0.01
	0.0050	0.13	+/- 0.0005	+/- 0.01
	0.0100	0.25	+/- 0.0007	+/- 0.02
	0.0150	0.38	+/- 0.0010	+/- 0.03
	0.0200	0.51	+/- 0.0015	+/- 0.04
	0.0250	0.64	+/- 0.0015	+/- 0.04
	0.0300	0.76	+/- 0.0020	+/- 0.05
	0.0310	0.79	+/- 0.0020	+/- 0.05
	0.0450	1.14	+/- 0.0020	+/- 0.05
	0.0600	1.52	+/- 0.0020	+/- 0.05
	0.0620	1.58	+/- 0.0020	+/- 0.05
	0.0900	2.29	+/- 0.0030	+/- 0.08
	0.0930	2.36	+/- 0.0030	+/- 0.08
	0.1200	3.05	+/- 0.0030	+/- 0.08
	0.1250	3.18	+/- 0.0035	+/- 0.09
TLC-27	0.0145	0.37	+/- 0.0010	+/- 0.03
TLE-95	0.0015	0.04	+/- 0.00025	+/- 0.01
	0.0035	0.09	+/- 0.00025	+/- 0.01
	0.0052	0.13	+/- 0.0005	+/- 0.01
	0.0100	0.25	+/- 0.0007	+/- 0.02
	0.0150	0.38	+/- 0.0010	+/- 0.03
	0.0200	0.51	+/- 0.0015	+/- 0.04
	0.0310	0.79	+/- 0.0020	+/- 0.05
	0.0620	1.58	+/- 0.0020	+/- 0.05
TLC-30, 32	0.0200	0.51	+/- 0.0015	+/- 0.04
	0.0300	0.76	+/- 0.0020	+/- 0.05
	0.0310	0.79	+/- 0.0020	+/- 0.05
	0.0450	1.14	+/- 0.0020	+/- 0.05
	0.0600	1.52	+/- 0.0020	+/- 0.05
	0.0620	1.58	+/- 0.0020	+/- 0.05
	0.0930	2.36	+/- 0.0030	+/- 0.08
	0.1250	3.18	+/- 0.0035	+/- 0.09
	0.1870	4.75	+/- 0.0050	+/- 0.13
TacPreg TPG-30	0.0045	0.11		
	0.0050	0.13		
TacLam TLG-30	Please call for available thicknesses			
RF-30	0.0100	0.25	+/- 0.0007	+/- 0.02
	0.0110	0.28	+/- 0.0007	+/- 0.02
	0.0200	0.51	+/- 0.0015	+/- 0.04
	0.0300	0.76	+/- 0.0020	+/- 0.05
	0.0600	1.52	+/- 0.0020	+/- 0.05
	0.1000	2.54	+/- 0.0040	+/- 0.10

Product	Available Thickness		Thickness Tolerance	
	(")	(mm)	(")	(mm)
TSM-30	0.0050	0.13	+/- 0.0007	+/- 0.02
	0.0100	0.25	+/- 0.0010	+/- 0.03
	0.0150	0.38	+/- 0.0015	+/- 0.04
	0.0200	0.51	+/- 0.0015	+/- 0.04
	0.0300	0.76	+/- 0.0020	+/- 0.05
	0.0600	1.52	+/- 0.0020	+/- 0.05
	TacPreg TPG-32	0.0045	0.11	
0.0050		0.13		
TacLam TLG-32	Please call for available thicknesses			
TacLam TLG-34				
TacPreg TPG-35	0.0045	0.11		
TacLam TLG-35	Please call for available thicknesses			
RF-35	0.0100	0.25	+/- 0.0007	+/- 0.02
	0.0200	0.51	+/- 0.0015	+/- 0.04
	0.0300	0.76	+/- 0.0020	+/- 0.05
	0.0600	1.52	+/- 0.0030	+/- 0.08
	0.1250	3.18	+/- 0.0050	+/- 0.13
RF-35A	0.0100	0.25	+/- 0.0007	+/- 0.02
	0.0200	0.51	+/- 0.0020	+/- 0.05
	0.0300	0.76	+/- 0.0020	+/- 0.05
	0.0600	1.52	+/- 0.0030	+/- 0.08
RF-35P	0.0020	0.05	+/- 0.0005	+/- 0.01
	0.0040	0.10	+/- 0.0005	+/- 0.01
	0.0060	0.15	+/- 0.0005	+/- 0.01
	0.0080	0.20	+/- 0.0007	+/- 0.02
	0.0100	0.25	+/- 0.0007	+/- 0.02
RF-60A	0.0140	0.36	+/- 0.0010	+/- 0.03
	0.0200	0.51	+/- 0.0015	+/- 0.04
	0.0300	0.76	+/- 0.0015	+/- 0.04
	0.0100	0.25	+/- 0.0007	+/- 0.02
	0.0250	0.64	+/- 0.0020	+/- 0.05
	0.0310	0.79	+/- 0.0020	+/- 0.05
CER-10	0.0500	1.27	+/- 0.0030	+/- 0.08
	0.0600	1.52	+/- 0.0030	+/- 0.08
	0.1250	3.18	+/- 0.0040	+/- 0.10
	0.0040	0.10	+/- 0.0005	+/- 0.01
	0.0080	0.20	+/- 0.0007	+/- 0.02
	0.0110	0.28	+/- 0.0010	+/- 0.03
	0.0150	0.38	+/- 0.0015	+/- 0.04
	0.0250	0.64	+/- 0.0020	+/- 0.05
	0.0300	0.76	+/- 0.0020	+/- 0.05
	0.0470	1.19	+/- 0.0030	+/- 0.08
0.0500	1.27	+/- 0.0030	+/- 0.08	
0.0620	1.58	+/- 0.0030	+/- 0.08	
0.1000	2.54	+/- 0.0040	+/- 0.10	
0.1250	3.18	+/- 0.0040	+/- 0.10	

\*Other thicknesses available upon request

\* www.iPCB.com