


Advanced PCB Materials

Product Selection Guide



This Selection Guide provides a sampling of the thousands of product configurations Taconic offers. If your design requires a specialized laminate or prepreg, please contact Taconic to discuss your application.

Taconic High Performance Materials - Typical Values

Part #	Composition	Dk	Df	Volume Resistivity Mohm/cm	Surface Resistivity Mohm	Flex Strength kpsi		Moisture Absorption %	Thermal Conductivity W/M*K	CTE * ppm/°C			Peel Strength lbs/in Very Low Profile Cu
						MD	CD			x	y	z	CV 1
TLY-5A	PTFE - Glass	2.17 ^(a)	0.0009 ^(a)	10 ¹⁰	10 ⁹	14	13	<0.02	0.22	20	20	280	12
TLP-5	PTFE - Glass	2.20 ^(a)	0.0009 ^(a)	10 ⁷	10 ⁷	>12	>10	<0.02	0.22	20	20	280	10
TLY-5	PTFE - Glass	2.20 ^(a)	0.0009 ^(a)	10 ¹⁰	10 ⁸	14	13	<0.02	0.22	20	20	280	12
TLY-3	PTFE - Glass	2.33 ^(a)	0.0012 ^(a)	10 ¹⁰	10 ⁸	14	13	<0.02	0.22	20	20	280	12
TLX-0, 9, 8, 7, 6	PTFE - Glass	2.45 - 2.65 ^(a)	0.0015 - 0.0021 ^(c)	10 ¹⁰	10 ⁸	>23	>17	<0.02	0.22	9	12	140	12
TLA-6	PTFE - Glass	2.65	0.0017	10 ¹²	10 ¹⁴	13	12	0.02	0.19	9	12	140	>10
TSM-26, 30	PTFE Ceramic - Glass	2.60 ^(c) , 3.00 ^(c)	0.0014 ^(c) , 0.0013 ^(c)	10 ⁸	10 ⁷	>7	>6	0.03	0.27	23	28	78	8
<i>fastFilm</i> TM 27 (FF-27) ^F	PTFE Ceramic - Film	2.70	0.0012	10 ⁸	10 ⁸	4	4	0.03	0.34	29	28	112	16
TLC-27, 30, 32, 338, 35	PTFE - Glass	2.75 - 3.50 ^(a)	0.0023 - 0.0037 ^(c)	10 ⁸	10 ⁸	24	19	<0.02	0.24	9	12	70	12
TSM-DS	PTFE Ceramic - Glass	2.85 ^(a)	0.0010 ^(a)	10 ⁸	10 ⁸	15	8	0.04	0.45	11	18	57	8
TLE-95	PTFE - Glass	2.95 ^(a)	0.0026 ^(a)	10 ⁹	10 ⁷	>24	>18	<0.02	0.28 ^(c)	9	12	70	12
RF-30	PTFE Ceramic - Glass	3.00 ^(b)	0.0014 ^(b)	10 ⁹	10 ⁸	20	16	0.02	0.20	11	21	208	10
TSM-DS3	PTFE Ceramic - Glass	3.00 ^(a)	0.0011 ^(a)	10 ⁸	10 ⁶	12	8	0.07	0.65	10	16	23	8
TLF-34, 35	PTFE - Glass	3.40 ^(b) , 3.50 ^(b)	0.0020 ^(c)	10 ⁹	10 ⁸	19	15	0.02	0.36	21	23	85	>10
RF-35TC	PTFE Ceramic - Glass	3.50 ^(c)	0.0011 ^(c)	10 ⁸	10 ⁷	13	12	0.05	0.60 [†] / 0.92 ^{††}	11	13	34	7
RF-35	PTFE Ceramic - Glass	3.50 ^(b)	0.0018 ^(b)	10 ⁹	10 ⁸	>22	>18	0.03	0.32 ^(c)	19	24	64	10
RF-35A2	PTFE Ceramic - Glass	3.50 ^(b)	0.0011 ^(b) , 0.0015 ^(c)	10 ⁸	10 ⁸	24	15	0.03	0.29	10	13	106	12
RF-35P	PTFE Ceramic - Glass	3.50 ^(b)	0.0022 ^(b)	10 ⁷	10 ⁷	>28	>16	0.03	0.33 ^(c)	15	15	110	10
RF-41, 43, 45	PTFE Ceramic - Glass	4.10 - 4.50 ^(d)	0.0033 - 0.0038 ^(c)	10 ⁸	10 ⁶	21	19	≤0.02, ≤0.02, ≤0.04	0.29, 0.30, 0.33	9	12	96	8
TRF-43, 45	PTFE Ceramic - Glass	4.30, 4.50	0.0035	10 ⁷	10 ⁷	17	15	0.06	0.43	9	9	40	>8
RF-60A	PTFE Ceramic - Glass	6.15 ^(d)	0.0038 ^(a)	10 ⁸	10 ⁸	>18	>15	0.02	0.40	9	8	69	8
CER-10 (0.0620 [™])	PTFE Ceramic - Glass	10.00 ^(d)	0.0035 ^(a)	10 ⁸	10 ⁹	>17	>16	<0.04	0.63	13	15	46	9

Prepregs/Bonding Films

FEP	Thermoplastic Film	2.00	0.0003										
HT-1.5	Thermoplastic Film	2.35	0.0025	10 ¹²	10 ¹⁰			0.01	0.22				
<i>fastRise</i> TM 27 (FR-27) ^F	Prepreg/Thermoset	2.70 ^(c)	0.0014 ^(c)	10 ⁸	10 ⁸			0.08	0.25	59	70	72	
<i>fastRise</i> TM DS (FR-DS) ^F	Prepreg/Thermoset	2.96	0.0018	10 ⁸	10 ⁶	>17	>8	0.10	0.36	11	17	66	
TPN-30	Prepreg/Thermoset	3.00	0.0038 ^(c)	10 ⁸	10 ⁹	20	15	0.13	0.25	21	23	108	
TPG-30, 35	Prepreg/Thermoset	3.00 ^(c) , 3.50 ^(c)	0.0038 ^(c) , 0.0050 ^(c)	10 ⁸	10 ⁹	20	15	0.13	0.25	21	23	108	
<i>fastRise</i> TM 77 (FR-77) ^F	Prepreg/Thermoset	7.70	0.0034	10 ⁵	10 ⁵	>15	>7	0.10	0.43	10	17	62	

(a) Measured by IPC-TM-650 method 2.5.5.5 (stripline resonator) at 10 GHz
 (b) Measured by IPC-TM-650 method 2.5.5.5.1 (modified stripline) at 1.9 GHz
 (c) Measured by IPC-TM-650 method 2.5.5.5.1 (modified stripline) at 10 GHz
 (d) Measured by IPC-TM-650 method 2.5.5.6 (full sheet resonant)
 (e) Measured by ASTM E1461

*CTE values vary by temperature range of measurement. Please inquire for specific product temperature range.

UL Rating for all products: 94 V-O except products designated with ^F

[†] Unclad ^{††} 1 oz. copper

Copper Cladding							
Copper Designation	Surface Roughness R_{MS} Treated side		Surface Roughness R_{MS} Untreated side		Description	Thickness	
	Microinches	Microns	Microinches	Microns		Mils	Microns
RH	16	0.4	7	0.2	Rolled-Annealed ½ 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 ½ oz	0.7	17.5
CL1	13	0.3	25	0.6	Reverse Treated Electrodeposited 1 oz	1.4	35.0
CEH	19	0.5	13	0.3	High Ductility Very Low Profile Electrodeposited ½ oz	0.7	18.0
CE1	19	0.5	13	0.3	High Ductility Very Low Profile Electrodeposited 1 oz	1.4	35.0
CVH (CH)	27	0.7	11	0.3	Very Low Profile Electrodeposited ½ 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

OhmegaPly®, Ticer® and other resistive foils available upon request. Please contact Taconic for availability.

OhmegaPly® is a registered trademark of Ohmega Technologies, Inc. Ticer® is a registered trademark of Ticer Technologies.

Heavy Metal Cladding - Available Upon Request				
Heavy Metal	Specific Gravity g/cm^3	Thermal Conductivity W/M*K	CTE ppm/°C	Machinability
Brass	8.5	120	20	Very Good
Copper	8.9	390	17	Good
Aluminum	2.7	180	24	Fair

Specialty Products

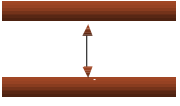


TacLamplus® is a cost-effective, laser ablatable, non-reinforced microwave substrate that is ideal for very low loss structures, MMIC packaging and mm-wave sensors.

TacLamplus®			
Material	Dk	Thickness	
		inches	mm
TacLamplus®	2.10	Increments of 0.0020	Increments of 0.0500

TacLam® & TacPreg® are available in thin-core constructions for high speed digital, RF multilayer and military applications.

TacLam® Laminates			
Material	Dk	Thickness	
		inches	mm
TLG-29	2.90	Increments of 0.0100	Increments of 0.254
TLG-30	3.00	0.0040, 0.0080, 0.0120	0.10, 0.20, 0.30

fastRise™ Prepreg

Product	Pressed Thickness (mil)	Pressed Thickness (mil)	Pressed Thickness (mil)	Nominal Dk (Min. / Max.) (10 GHz)	Typical Flow (%)
FR-26-0025-60	2.7	1.3	1.0	2.58	17
FR-27-0030-25'	3.5	2.1	Not recommended	2.74 (2.71 / 2.78)	4
FR-27-0035-66	3.7	2.5	2.1	2.70	36
FR-27-0040-25'	4.9	3.7	Not recommended	2.74	4
FR-28-0040-50	4.9	3.7	3.5	2.81 (2.80 / 2.82)	23
FR-27-0042-75	5.16	3.96	3.5	2.73	35
FR-27-0045-35	5.8	4.6	4.2	2.75 (2.73 / 2.77)	13
FR-27-0050-40	6.1	5.5	4.9	2.76 (2.71 / 2.80)	23
					

Common Thicknesses & Tolerances

Additional thicknesses & tolerances are available upon request

Product	Available Thickness		Thickness Tolerance	
	(inches)	(mm)	(inches)	(mm)
TLY-3, 5, 5A	0.0035	0.09		
	0.0050 (TLY-3, 5)	0.13	+/- 0.0005	+/- 0.01
	0.0100	0.25	+/- 0.0007	+/- 0.02
	0.0200	0.51	+/- 0.0015	+/- 0.04
	0.0310	0.79	+/- 0.0020	+/- 0.05
	0.0620	1.58	+/- 0.0020	+/- 0.05
	0.0930	2.36	+/- 0.0030	+/- 0.08
TLX (TLT)-6, 7, 8, 9, 0	0.0017	0.04		
	0.0050	0.13	+/- 0.0005	+/- 0.01
	0.0100	0.25	+/- 0.0007	+/- 0.02
	0.0200	0.51	+/- 0.0015	+/- 0.04
	0.0310	0.79	+/- 0.0020	+/- 0.05
	0.0620	1.58	+/- 0.0020	+/- 0.05
	0.1250	3.18	+/- 0.0030	+/- 0.08
TLA-6	0.0300	0.76	+/- 0.0020	+/- 0.05
	0.0570	1.45	+/- 0.0020	+/- 0.05
TLE-95	0.0015	0.04	+/- 0.0002	+/- 0.005
	0.0035	0.09	+/- 0.00025	+/- 0.01
	0.0052	0.13	+/- 0.0005	+/- 0.01
	0.0100	0.25	+/- 0.0007	+/- 0.02
	0.0200	0.51	+/- 0.0015	+/- 0.04
TLG-29, 30	0.0100	0.25	+/- 0.0007	+/- 0.02
	0.0200	0.51	+/- 0.0020	+/- 0.04
TLC-30, 32	0.0200	0.51	+/- 0.0015	+/- 0.04
	0.0310	0.79	+/- 0.0020	+/- 0.05
	0.0450	1.14	+/- 0.0020	+/- 0.05
	0.0620	1.58	+/- 0.0020	+/- 0.05
RF-30	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	+/- 0.0020	+/- 0.05
TSM-26	0.0035	0.09	+/- 0.0020	+/- 0.05
	0.0070	0.18	+/- 0.0020	+/- 0.05
	0.0105	0.27	+/- 0.0020	+/- 0.05
TSM-30 TSM-DS TSM-DS3	0.0050	0.13	+/- 0.0005	+/- 0.02
	0.0100	0.25	+/- 0.0010	+/- 0.03
	0.0200	0.51	+/- 0.0020	+/- 0.04
	0.0300	0.76	+/- 0.0020	+/- 0.05
TLF-34, 35	0.0600	1.52	+/- 0.0020	+/- 0.05
	0.0100	0.25	+/- 0.00098	+/- 0.025
	0.0200	0.51	+/- 0.00196	+/- 0.050
	0.0300	0.76	+/- 0.00196	+/- 0.050
	0.0600	1.52	+/- 0.00196	+/- 0.050

Product	Available Thickness		Thickness Tolerance	
	(inches)	(mm)	(inches)	(mm)
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
RF-35A2	0.0050	0.13	+/- 0.0005	+/- 0.013
	0.0100	0.25	+/- 0.0010	+/- 0.02
	0.0200	0.51	+/- 0.0020	+/- 0.05
	0.0300	0.76	+/- 0.0020	+/- 0.05
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
RF-41	0.0600	1.52	+/- 0.0020	+/- 0.05
	0.1250	3.18	+/- 0.0035	+/- 0.09
RF-43	0.0100	0.25	+/- 0.0010	+/- 0.03
	0.0200	0.51	+/- 0.0015	+/- 0.05
	0.0300	0.76	+/- 0.0015	+/- 0.04
	0.0620	1.58	+/- 0.0020	+/- 0.05
RF-45	0.1250	3.18	+/- 0.0035	+/- 0.09
	0.0200	0.51	+/- 0.0015	+/- 0.04
	0.0310	0.79	+/- 0.0020	+/- 0.05
	0.0620	1.58	+/- 0.0020	+/- 0.05
TRF-43, 45	0.1250	3.18	+/- 0.0035	+/- 0.09
	0.0080	0.20	+/- 0.0010	+/- 0.025
	0.0320	0.81	+/- 0.0020	+/- 0.050
	0.0640	1.63	+/- 0.0020	+/- 0.050
RF-60A	0.1200	3.05	+/- 0.0035	+/- 0.090
	0.0100	0.25	+/- 0.0010	+/- 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
	0.0110	0.28	+/- 0.0010	+/- 0.03
Cer-10	0.0250	0.64	+/- 0.0020	+/- 0.05
	0.0300	0.76	+/- 0.0020	+/- 0.05
	0.0470	1.19	+/- 0.0030	+/- 0.08
	0.0620	1.58	+/- 0.0030	+/- 0.08
	0.1250	3.18	+/- 0.0040	+/- 0.10
	0.1250	3.18	+/- 0.0040	+/- 0.10

Standard Sizes (Additional Sizes Available)			
Typical Size		Long Laminates	
Inches	mm	Inches	mm
36 W x 48 L	914 W x 1220 L	36 W x 60 L 36 W x 76 L 36 W x 102 L	914 W x 1524 L 914 W x 1930 L 914 W x 2590 L

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. The above information creates no express or implied warranties.

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