


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 K psi		Moisture Absorption %	k _T W/m/K	CTE * ppm/°C			Peel Strength lbs/in 1 oz Cu
						MD	CD			x	y	z	
TLY-5A	PTFE - Glass	2.17 ^(a)	0.0009 ^(a)	10 ¹⁰	10 ⁷	>14	>14	<0.02	0.22	20	20	280	12
TLY-5	PTFE - Glass	2.20 ^(a)	0.0009 ^(a)	10 ¹⁰	10 ⁷	14	>12	<0.02	0.22	20	20	280	12
TLY-3	PTFE - Glass	2.33 ^(a)	0.0012 ^(a)	10 ⁹	10 ⁷	>19	>14	<0.02	0.22	20	20	280	12
HT 1.5 [‡]	Bonding Film	2.35	0.0025	10 ¹²	10 ¹⁰			0.005					
TLX-0, 9, 8, 7, 6	PTFE - Glass	2.45-2.65 ^(a)	0.0015-0.0021 ^(c)	10 ⁹	10 ⁷	>23	>19	<0.02	0.22	9	12	140	12
fastRise™27 (FR-27) [‡]	Prepreg/Thermoset	2.70 ^(c)	0.0014 ^(c)	10 ⁸	10 ⁸			0.08	0.25	59	70	72	6
TLC-27, 30, 32	PTFE - Glass	2.75 ^(a) , 3.00 ^(a) , 3.20 ^(a)	0.0022 ^(c) , 0.0028 ^(c) , 0.0030 ^(c)	10 ⁸	10 ⁷	>24	>18	<0.02	0.24	9	12	70	12
TLG-29, 30	PTFE Ceramic - Glass	2.87 ^(c) , 3.00 ^(c)	0.0027 ^(c) , 0.0038 ^(c)	10 ⁷	10 ⁶	10.2, 20	8.8, 22.1	0.14, 0.16	0.31, 0.27	21-23	21-23	135	13
TSM-29, 30	PTFE Ceramic - Glass	2.94 ^(c) , 3.00 ^(c)	0.0015 ^(c)	10 ⁸	10 ⁷	>6.9	>6	0.03	0.27	23	28	78	8
TLE-95	PTFE - Glass	2.95 ^(a)	0.0026 ^(a)	10 ⁸	10 ⁷	>24	>18	<0.02	0.28 ^(e)	9	12	70	12
TPG-30	Prepreg/Thermoset	3.00 ^(c)	0.0038 ^(c)	10 ⁸	10 ⁹	19.9	14.9	0.13	0.25	21	23	108	13
RF-30	PTFE Ceramic - Glass	3.00 ^(b)	0.0014 ^(b)	10 ⁹	10 ⁸	16	12	0.02	0.20	11	21	208	10
TLG-32, 33, 34, 35	PTFE Ceramic - Glass	3.20-3.50 ^(c)	0.0032-0.0036 ^(c)	10 ⁷	10 ⁶	20	22.1	0.16	0.27	8	12	61	5.5
RF-32, 34	PTFE Ceramic - Glass	3.20 ^(c) , 3.40 ^(c)	0.0024 ^(c) , 0.0034 ^(c)	10 ⁸	10 ⁷	>28	>16	0.02	0.26	15	15	110	12
TPG-35	Prepreg/Thermoset	3.50 ^(c)	0.0050 ^(c)	10 ⁸	10 ⁹	19.9	14.9	0.13	0.25	21	23	28	13
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 ⁹	10 ⁸	24	14	0.03	0.28	10	13	106	12
RF-35P	PTFE Ceramic - Glass	3.50 ^(b)	0.0025 ^(b)	10 ⁸	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	20.7	18.8	<0.02, ≤0.02, ≤0.04	0.29, 0.30, 0.33	9	12	96	8
RF-60A	PTFE Ceramic - Glass	6.15 ^(d)	0.0038 ^(a)	10 ⁸	10 ⁸	>18.3	>14.6	0.02	0.40	9	8	69	8
CER-10 (0.0620 [™])	PTFE Ceramic - Glass	10.0 ^(d)	0.0035 ^(a)	10 ⁸	10 ⁸	>16.5	>15.5	<0.04	0.63	13	15	46	9
Flex Materials													
HyRelex™ TF-260 [‡]	PTFE - Glass	2.60 ^(c)	0.0020 ^(c)	10 ¹⁰	10 ⁷	> 23	> 20	< 0.02	0.22	9	12	140	7
fastFilm™27 (FF-27) [‡]	PTFE Ceramic Film	2.70	0.0012	10 ⁸	10 ⁸	4.42	4.36	0.03		29	28	112	16
HyRelex™ TF-290 [‡]	PTFE - Glass	2.90 ^(c)	0.0028 ^(c)	10 ⁸	10 ⁷	> 35	> 30	< 0.02	0.28	9	12	70	7

* 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 [‡]

^(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

Copper Cladding

Copper Designation	Surface Roughness R_{MS} Treated side		Surface Roughness R_{MS} 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
CEH	19	0.5	13	0.3	High Ductility Very Low Profile Electrodeposited 1/2 oz	0.7	18
CE1	19	0.5	13	0.3	High Ductility Very Low Profile Electrodeposited 1 oz	1.4	35
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

Ohmega Ply, Ticer and other resistive films available upon request. Please contact Taconic for availability.

Heavy Metal Cladding - Available Upon Request

Heavy Metal	Specific Gravity	k_T 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 - Prepregs & Laminates

HyRelex - Low loss flexible laminates offer excellent thermal, mechanical, electrical and moisture resistant properties.

fastFilm™ 27 - Non-reinforced film for high frequency/temperature and harsh environment applications.

HyRelex / fastFilm™ 27			
Material	Dk	Thickness	
		inches	mm
HyRelex® TF-260	2.60	0.0017, 0.0030	0.04, 0.08
fastFilm™ FF-27	2.70	0.002, 0.003	0.05, 0.07
HyRelex® TF-290	2.90	0.0023, 0.0035	0.06, 0.09

TRF - Low loss, thermally stable laminates for satellite radio, antenna and RFID applications.

TRF Laminates				
Material	Dk	Df	Thickness	
			inches	mm
TRF-41	4.1	0.0035	0.0080 - 0.1200	0.20 - 3.05
TRF-43	4.3	0.0035	0.0080 - 0.1200	0.20 - 3.05
TRF-45	4.5	0.0035	0.0080 - 0.1200	0.20 - 3.05

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 0.05

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

TacPreg® Prepregs			
Material	Dk	Thickness	
		inches	mm
TacPreg® TPG-30	3.00	0.0045, 0.0050	0.11, 0.13
TacPreg® TPG-32	3.20	0.0045, 0.0050	0.11, 0.13
TacPreg® TPG-35	3.50	0.0045	0.11

fastRise™ Pressed Thickness (mil)			
FR-27-0030-25	3.5	2.13	1.82
FR-27-0040-25 FR-27-0040-50	4.9	3.74	3.51
FR-27-0045-35	5.8	4.61	4.23
FR-27-0050-40	6.1	5.50	4.85

0.5 oz. Cu, 50% removal 1 oz. Cu, 50% removal

Common Thicknesses & Tolerances

Additional thicknesses & tolerances are available upon request

Product	Available Thickness		Thickness Tolerance	
	(inches)	(mm)	(inches)	(mm)
TLY-3, 5, 5A	0.0050 (TLY-3, 5)	0.13	+/- 0.0005	+/- 0.01
	0.0100	0.25	+/- 0.0007	+/- 0.02
	0.0200	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
TacBond HT 1.5	0.0015	0.04		
TLX (TLT)-6, 7, 8, 9, 0	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	2.36	+/- 0.0030	+/- 0.08
TLC-27	0.0145	0.37	+/- 0.0010	+/- 0.03
TLE-95	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
TPG-30	0.0045	0.11		
	0.0050	0.13		
TLG-29, 30, 32, 33, 34, 35	0.0100	0.25	+/- 0.0007	+/- 0.02
	0.0200	0.51	+/- 0.0020	+/- 0.04
	0.0300	0.76	+/- 0.0020	+/- 0.05
	0.0600	1.52	as agreed upon between customer and supplier	
	0.1200	3.05		
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
	0.0930	2.36	+/- 0.0030	+/- 0.08
	0.1250	3.18	+/- 0.0030	+/- 0.08
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-29, 30	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
	0.0600	1.52	+/- 0.0020	+/- 0.05

Product	Available Thickness		Thickness Tolerance	
	(inches)	(mm)	(inches)	(mm)
TPG-35	0.0045	0.11		
RF-34, 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	0.0100	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
RF-60A	0.0620	1.58	+/- 0.0020	+/- 0.05
	0.1250	3.18	+/- 0.0035	+/- 0.09
	0.0100	0.25	+/- 0.0010	+/- 0.02
	0.0250	0.64	+/- 0.0020	+/- 0.05
	0.0310	0.79	+/- 0.0020	+/- 0.05
	0.0500	1.27	+/- 0.0030	+/- 0.08
Cer-10	0.0600	1.52	+/- 0.0030	+/- 0.08
	0.1250	3.18	+/- 0.0040	+/- 0.10
	0.0110	0.28	+/- 0.0010	+/- 0.03
	0.0250	0.64	+/- 0.0020	+/- 0.05
	0.0300	0.76	+/- 0.0020	+/- 0.05
	0.0470	1.19	+/- 0.0030	+/- 0.08

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.

Ohmega Ply[®] is a registered trademark of Ohmega Technologies, Inc. Ticer[®] is a registered trademark of Ticer Technologies.

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