

HyRelex

Low Loss, High Reliability, Thin, Flexible Interconnect Materials

Exceptionally Low Loss

Low DK

Excellent Peel Strength

Superior High Temperature Performance

Low Moisture Absorption

Excellent Dimensional Stability

Adhesiveless

UL 94 V-0

TACONIC

An ISO 9001:2000 Registered Company

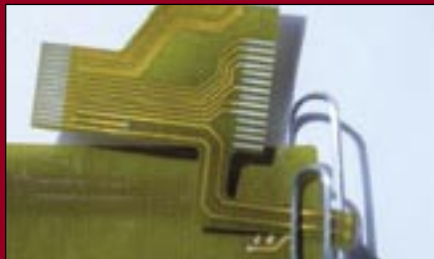
Petersburgh, NY: Tel: 800-833-1805 Fax: 518-658-3988

Europe: Tel: +353-44-9395600 Fax: +353-44-9344369 Asia: Tel: +82-31-704-1858 Fax: +82-31-704-1857

www.taconic-add.com

APPLICATIONS

Double Sided, Multilayer &
Rigid Flex Circuits
Telecommunications
High Frequency
Avionics
Medical
Consumer Electronics
Military
Automotive



HyRelex

HyRelex is a family of low loss, high reliability, flexible laminates and bonding materials. It is constructed with the benefits of reinforced high temperature polymer chemistry to provide excellent thermal, mechanical, electrical and moisture resistant properties. HyRelex is the best value for the high performance demands of flexible applications.

The low dissipation factor, thermal stability and smooth surface profile minimize phase shift with frequency and temperature, and yields exceptional low loss circuit performance. HyRelex is ideally suited for high frequency, high temperature, and harsh environment applications.

HyRelex has excellent peel strengths for the high temperature assembly and power handling requirements. HyRelex exhibits exceptional dimensional stability yielding fine feature registration. HyRelex laminates are generally ordered clad on both sides with 17 and 35 micron (1/2 and 1 oz) rolled or high elongation electrodeposited copper.

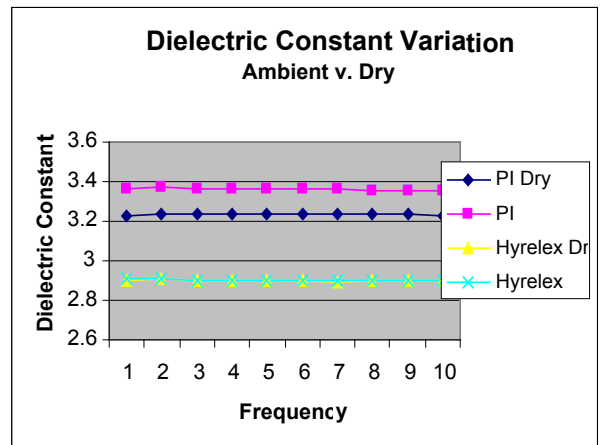
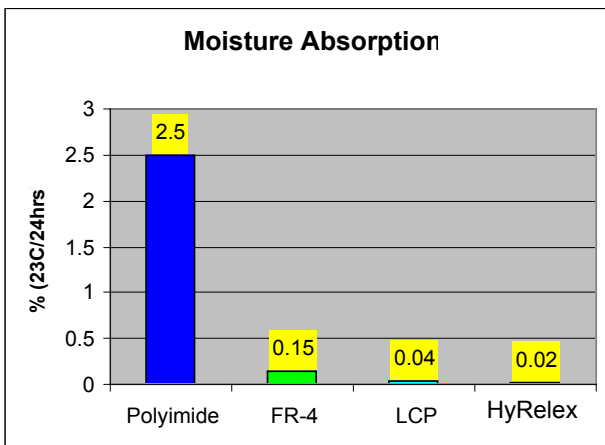
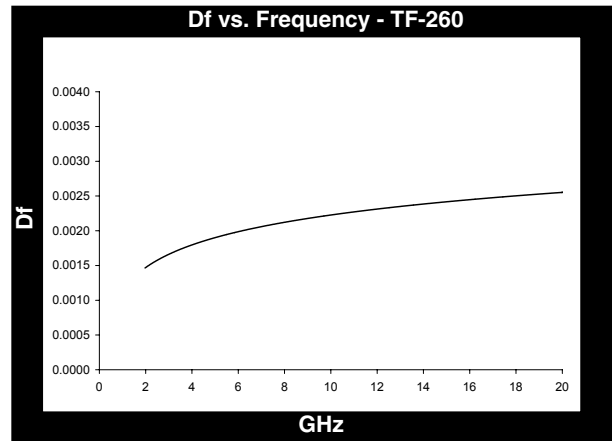
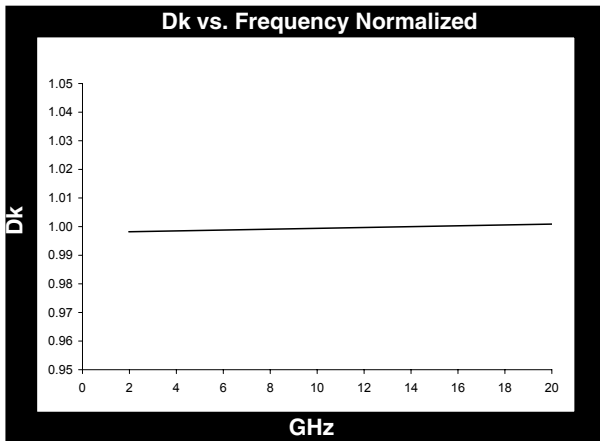
HyRelex laminates exhibit flammability of V-0, with a thermal index rating (RTI) >150°C. The materials are tested in accordance with IPC-TM 650. A certificate of conformance containing lot-specific data accompanies each shipment.

See "How to Order" on back page for a complete product listing.

HyRelex Typical Values

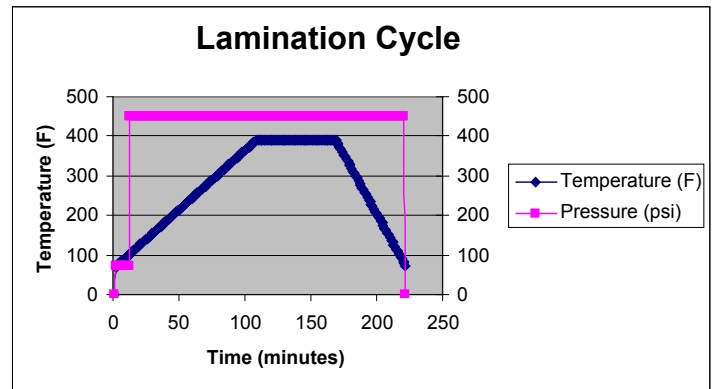
Property	Test Method	Unit	Value		Unit	Value	
Product			TF-260	TF-290		TF-260	TF-290
Dielectric Constant @ 10 GHz	IPC-TM-650 2.5.5.5.1		2.60	2.90		2.60	2.90
Dissipation Factor @ 10 GHz	IPC-TM-650 2.5.5.5.1		0.0020	0.0028		0.0020	0.0028
Moisture Absorption	IPC-TM-650 2.6.2.1	%	<0.02		%	<0.02	
Dielectric Breakdown	IPC-TM-650 2.5.6	kV	>60		kV	>60	
Volume Resistivity	IPC-TM-650 2.5.17.1	Mohm/cm	10 ⁷		Mohm/cm	10 ⁷	
Surface Resistivity	IPC-TM-650 2.5.17.1	Mohm	10 ⁷		Mohm	10 ⁷	
Arc Resistance	IPC-TM-650 2.5.1	Seconds	>180		Seconds	>180	
Flexural Strength (MD)	IPC-TM-650 2.4.4	psi	>23,000	>35,000	N/mm ²	>159	>241
Flexural Strength (CD)	IPC-TM-650 2.4.4	psi	>20,000	>30,000	N/mm ²	>138	>207
Peel Strength (1 oz VLP)	IPC-TM-650 2.4.8 Sec 5.2.2 (Thermal Stress)	lbs/linear inch	7		N/mm	1.2	
Thermal Conductivity	ASTM F 433	W/m/K	0.20		W/m/K	0.20	
CTE (x-y)	ASTM D 3386 (TMA)	ppm/°C	9-12		ppm/°C	9-12	
CTE (z)	ASTM D 3386 (TMA)	%	3	2	%	3	2
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.



TPF Bond-Ply & TCF Coverlay

TacPreg® flexible bond-ply and coverlay are specifically designed to facilitate bonding for HyRelex TF laminates for flex and flex rigid multilayer applications. TacPreg® flexible bond-ply is constructed with the base material used to produce the HyRelex laminate coated with a flexible thermoset resin. TacPreg® flexible coverlay is constructed with a high temperature polymer film coated with a flexible thermoset resin on one side. These unique composites provide excellent chemical, moisture, high temperature and electrical performance properties with the processing bonding advantages of a thermoset resin system. A further advantage is the ability to closely match



the dielectric constant of the bond-ply and coverlay with the HyRelex laminate.

Typical Properties					
Property	Test Method	Unit	Value		
			Bond-Ply		Coverlay
Material			TPF-27	TPF-30	TCF-27
Cure Temperature		°F / °C	380-400 / 190-200		
Dielectric constant	IPC TM 650 2.5.5.5.1		2.70	3.00	2.70
Dissipation Factor	IPC TM 650 2.5.5.5.1		0.004	0.004	0.004
Moisture Absorption	IPC TM 650 2.6.2.1	%	0.5		
Flammability Rating	UL 94		V-0		

TacPreg® Flexible Bond-Ply TPF	
Property	Benefit
Flexible Thermoset Coating	Excellent for sequential lamination
Dielectric constant	Closely Matches DK of laminate
Dissipation factor	Good low loss performance
380-390°F Cure temperature	Wide industry capability

How To Order			
	Bond-Ply		Coverlay
Designation	TPF-27	TPF-30	TCF-27
Typical Thicknesses	0.0045"	0.0030"	0.0015" (0.0005" adhesive) 0.0020" (0.0010" adhesive)
Typical Panel Size	18" x 24"	18" x 24"	18" x 24"

An example of our part number is: **TPF-27-0045 - 18" x 24" (457 mm x 610 mm)**

How To Order

Designation	Dielectric Constant	Typical Thicknesses		Available Panel Sizes ¹	
TF-260	2.60	0.0010"	0.03 mm	12" x 18"	304 mm x 457 mm
		0.0020"	0.05 mm		
		0.0030"	0.08 mm	16" x 18"	406 mm x 457 mm
		0.0040"	0.10 mm		
TF-290	2.90	0.0015"	0.04 mm	18" x 24"	457 mm x 610 mm
		0.0020"	0.05 mm	16" x 36"	406 mm x 914 mm
		0.0035"	0.09 mm	24" x 36"	610 mm x 914 mm

¹Our standard sheet size is 36" x 48" (914 mm x 1220 mm). Please contact our customer service department for availability of other sizes.

Available Copper Cladding						
Designation	Weight	Copper Thickness		R _{MS} Treated Side		Description
RH	1/2 oz / ft ²	~0.0007	~18 μm	16 μin	0.4 μm	Rolled annealed
R1	1 oz / ft ²	~0.0014	~35 μm	11 μin	0.3 μm	Rolled annealed
CE1	1 oz / ft ²	~0.0014	~35 μm	25 μin	0.6 μm	High elongation / Electrodeposited
CEH	1/2 oz / ft ²	~0.0007"	~18 μm	27 μin	0.7 μm	High elongation / Electrodeposited
CEQ	1/4 oz / ft ²	~0.0004"	~9 μm	19 μin	0.5 μin	High elongation / Electrodeposited

Ohmega-Ply® and Gould resistive foils also available upon request

Ohmega-Ply® is a registered trademark of Ohmega Technologies

An example of our part number is: **TF-260-0020-CE1/CE1 - 18" x 24" (457 mm x 610 mm)**

TACONIC

An ISO 9001:2000 Registered Company

Petersburgh, NY: Tel: 800-833-1805 Fax: 518-658-3988

Europe: Tel: +353-44-9395600 Fax: +353-44-9344369 Asia: Tel: +82-31-704-1858 Fax: +82-31-704-1857

www.taconic-add.com