Panasonic INDUSTRY

Applications
Aerospace/Industry/Automotive
Consumer mobile products (Smartphone, tablet PC), Medical, Industrial, Avionics/Space applications, In-vehicle cable (Wire harness alternative), etc.

Halogen -free

FELIOS

Double-sided copper clad **R-F775**

Single-sided copper clad **R-F770**

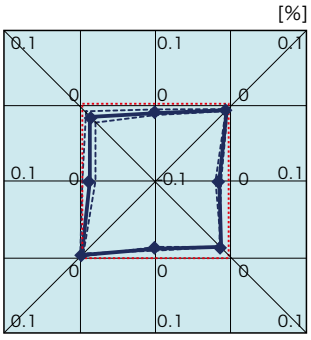
Flexible circuit board materials

FELIOS adhesiveless flex materials are available in a wide-range of film and copper foil thicknesses to support all applications. FELIOS offers superior thermal resistance, dimensional stability and quality. Suitable for aerospace applications with low outgassing. (Compliant with ASTM E-595)

Dimensional stability

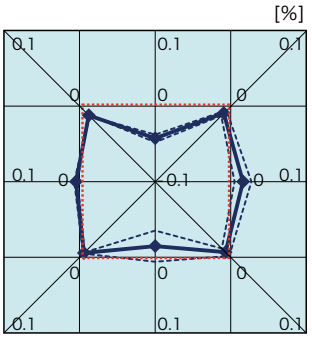
Dimensional change after etching

Panasonic Industry FCCL materials
R-F775 After etching



Comparative material

After etching



Evaluation material is R18-100-R18, thickness 4mil.

The above data are typical values and not guaranteed values

Line-up

Available in various film and copper foil combinations. **Roll-cut type** MAX 610mm(MD) x 500mm(TD)
Roll type W=250mm, 500mm

Copper foil thickness		Film thickness 0.5 (0.013)	1.0 (0.025)	2.0 (0.050)	3.0 (0.075)	4.0 (0.100)	5.0 (0.125)	6.0 (0.150)
		Unit: mils (mm)						
RA copper foil	1/4oz (9μm)	●*1	●*1	●*1	-	-	-	●*1
	1/3oz (12μm)	●	●	●	●	●	-	-
	1/2oz (18μm)	●	●*2	●*2	●*2	●*2	●*2	●
	1oz (35μm)	●*1	●*2	●*2	●*2	●*2	●*2	●
	2oz (70μm)	-	●*2	●*2	●	●	●	-
	3oz(105μm)	-	●	●	-	-	-	-
ED copper foil	- (2μm)	●	●	●	●	-	-	-
	1/6oz (6μm)	●	●	●	-	-	-	-
	1/4oz (9μm)	●	●	●	●	●	●	●
	1/3oz (12μm)	●	●	●	●	●	●	●
	1/2oz (18μm)	●	●	●	●	●	-	-
	1oz (35μm)	-	●	●	●	●	-	-

*1 Special option *2 W=610mm is optional.
Our Halogen-free materials are based on JPCA-ES-01-2003 standard and others.

Please refer to the next page for General properties.

General properties

Item		Test method	Condition	Unit	FELIOS R-F775
Solder heat resistance		IPC-TM-650	A	℃	**280**
			C-96/40/90		**240**
Tensile modulus		ASTM D882	A	GPa	**7.5**
Peel strength	RA: 1/2oz(18μm)	IPC-TM-650	A	N/mm	**>1.4**
CTE	MD	TMA	100℃→250℃ 5℃/min	ppm/℃	**20**
	TD				**18**
Dimensional stability		IPC-TM-650	After etching MD	%	**0.00±0.10**
			After etching TD		**0.00±0.10**
Outgas	TML*	ASTM E595-07 ASTM E595-15	–	%	**0.62**
	CVCM*				**0.001**
	WVR*				**0.51**

The sample thickness is film 50μm, copper foil 18μm.
* TML: Total Mass Loss
CVCM: Collected Volatile Condensable Material
WVR: Water Vapor Recovered

Our Halogen-free materials are based on JPCA-ES-01-2003 standard and others.
The above data are typical values and not guaranteed values.

Please see our website for Notes before you use.

Panasonic Industry Co., Ltd. Electronic Materials Business Division