

Flex stack-up examples (1 to 4 layers)

1 Layer	0,135mm +/- 0,02mm		
*Coverlay SF302C 0513	PI Cover lay	25,0	µm
	adhesive	20,0	µm
Core Layer SF302 103520SR	Base Copper	35,0	µm
	adhesive	20,0	µm
	PI base film	25,0	µm
**Stiffener	FR4 (NPTH) ref. 300µm		

2 Layer	0,173mm +/- 0,02mm		
*Coverlay 1 SF302C 0513	PI Coverlay	13,0	µm
	Adhesive (epoxy)	13,0	µm
	Added Copper	10,0	µm
Core Layer SF302 101820DE	Base Copper	18,0	µm
	Adhesive (epoxy)	20,0	µm
	PI base film	25,0	µm
	Adhesive (epoxy)	20,0	µm
	Base Copper	18,0	µm
	Added Copper	10,0	µm
*Coverlay 2 SF302C 0513	Adhesive (epoxy)	13,0	µm
	PI Cover lay	13,0	µm
**Stiffener	FR4 (NPTH) ref. 300µm		

4 Layer	= 0,241mm +/- 0,03mm		
*Coverlay 1 SF302C 0513	PI Cover lay	13,0	µm
	adhesive	13,0	µm
	Added Copper	10,0	µm
Top Layer SF302 051813SR	Base Copper	18,0	µm
	adhesive	13,0	µm
	PI base film	13,0	µm
Bonding Sheet 1 SF302B 13	adhesive, bonding sheet	13,0	µm
Core Layer SF302 051813DR	Base Copper	18,0	µm
	adhesive	13,0	µm
	PI base film	13,0	µm
	adhesive	13,0	µm
	Base Copper	18,0	µm
Bonding Sheet 1 SF302B 13	adhesive, bonding sheet	13,0	µm
Bottom Layer SF302 051813SR	PI base film	13,0	µm
	adhesive	13,0	µm
	Base Copper	18,0	µm
	Added Copper	10,0	µm
*Coverlay 2 SF302C 0513	adhesive	13,0	µm
	PI Cover lay	13,0	µm
**Stiffener	FR4 (NPTH) ref. 300µm		

*Instead of adhesive PI Coverlay there may be used yellow or green photo image able solder mask with a thickness of around 15µm in case of small solder mask openings.

**Stiffeners are optional

PI: Polyimid (Kapton™)

Flame-resistant polyimide (PI) film based flexible copper clad laminates: materials

Specification	Thickness [µm]			Single/Double sided	Copper type
	PI film	Copper foil	Adhesive		
SF302 051813SR	13,0	18	13	single	RA
SF302 051813DR	13,0	18	13	double	RA
SF302 051813SE	13,0	18	13	single	ED
SF302 051813DE	13,0	18	13	double	ED
SF302 101820SR	25,0	18	20	single	RA
SF302 101820DR	25,0	18	20	double	RA
SF302 101820SE	25,0	18	20	single	ED
SF302 101820DE	25,0	18	20	double	ED
SF302 103520SR	25,0	35	20	single	RA
SF302 103520SE	25,0	35	20	single	ED
SF302 203520SR	50,0	35	20	single	RA
SF302 203520DR	50,0	35	20	double	RA
SF302 203520SE	50,0	35	20	single	ED
SF302 203520DE	50,0	35	20	double	ED
SF302 207020SE	50,0	70	20	single	ED
SF302 303520SR	75,0	35	20	single	RA

PI: Polyimid

RA-copper: „Rolled Annealed“

ED-copper: “Electrolytic Deposit“

Flame-resistant polyimide (PI) film based flexible copper clad laminates: specifications

Features:

- Excellent flexibility, soldering reliability, chemical resistance and dimensional stability
- High peel strength, flammability UL94V-0
- Excellent mechanical and electrical properties
- RoHS compliant: Free of Pb, Hg, Cd, Cr⁵⁺, PBB, PBDE etc.

Test item	Treatment conditions	Unit	Secifications	
			Typical value	
			051813SR	101820SE
Peel strength (90°)	A	N/mm	1,5	1,8
	288°C, 5s		1,4	1,7
Folding Endurance (MIT-R0.38x4.9N)	A	Times	>300	>150
Minimum bending radius*			IPC 2223	IPC 2223
Solder float	300°C, 30s		pass	pass
Maximum operating temperature		C°	200**	200**
Tg		C°	220**	220**
Dimensional MD Stability TD	E-0.5/150	%	-0,07	-0,05
			0,06	0,05
Chemical resistance	2mol/l NaOH		pass	pass
	2mol/l HCl		pass	pass
	IPA		pass	pass
Dielectric constant (1MHz)	C-24/23/50		3,5	3,5
Dissipation factor	C-24/23/50		0,031	0,032
Resistivity	C-96/35/90	MΩ*m	2,0x10 ⁸	2,0x10 ⁸
Surface resistance	C-96/35/90	MΩ	2,0x10 ⁷	2,0x10 ⁷
Electrical strength	D-48/50+D-0.5/23	V/μm	135	150
Moisture absorption	E-1/105+D-24/23	%	0,9	1,1
Flammability	C-48/23/50		UL94 V-0	UL94 V-0

C = humidity conditioning; D = immersion conditioning in distilled water; E = Temperature conditioning

*send an enquiry to kontakt@leiton.de to receive the exact IPC specifications.

**limited through the lower values from the adhesive between copper and PI base film. See next table for total FPC performance.

Flame Resistant epoxy bonding film (adhesive/prepreg) for multilayers: specifications

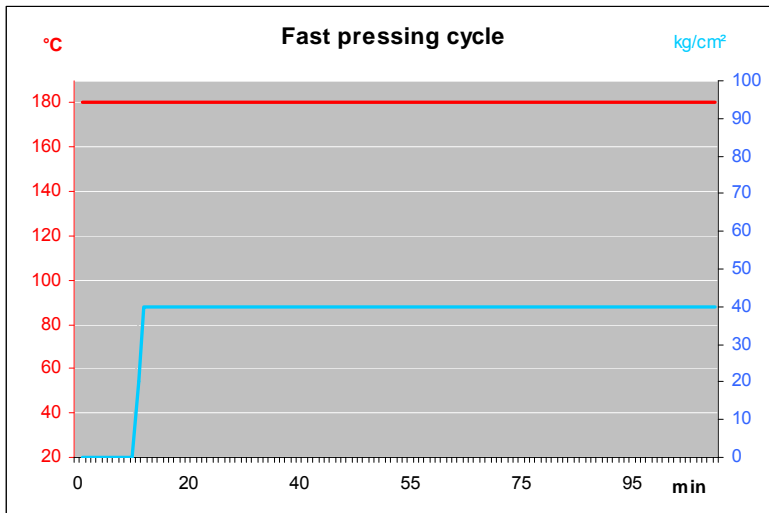
Features

- High bonding strength, good dimensional stability
- Flammability UL94V-0
- Excellent soldering reliability, chemical resistance and electrical properties
- Low adhesive flowing, good processability, suitable for both fast and traditional lamination style
- RoHS compliant: Free of Pb, Hg, Cd, Cr⁵⁺, PBB, PBDE etc.

Test item	Treatment conditions	Unit	Property data	
			Typical value	
			051813SR	101820SE
Peel strength (90°)	A	N/mm	1,1	1,4
	288°C, 5s		0,9	1,3
Resin flow		mm	<0,15	<0,15
Solder float	300°C,10s		pass	pass
Maximum operating temperature		C°	120	120
Tg		C°	135	135
Chemical resistance	2mol/l NaOH		pass	pass
	2mol/l HCl		pass	pass
	IPA		pass	pass

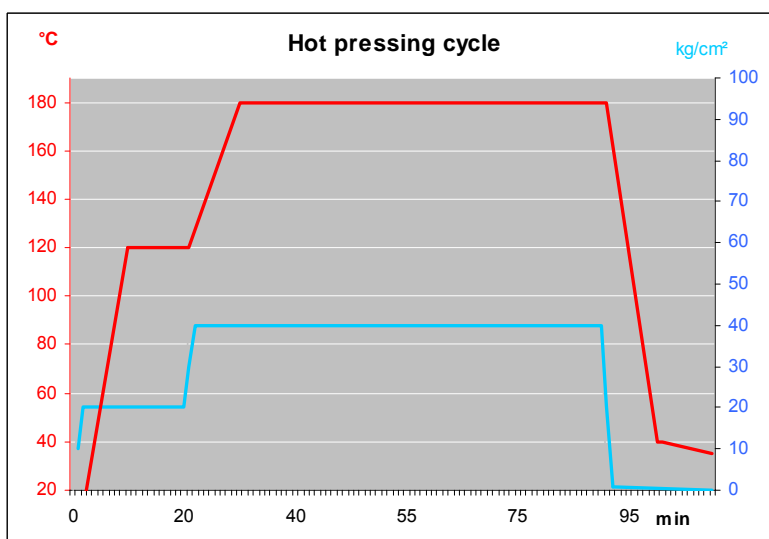
Flame Resistant epoxy bonding film (adhesive/prepreg) for multilayers: materials

Specification	Adhesive thickness [μm]
SF302B 13	13,0
SF302B 15	15,0
SF302B 25	25,0
SF302B 35	35,0
SF302B 50	50,0
Preferred:	



Explanation:

After fast press, the curing condition is 170±10°C for 90 min.



Flame-resistant polyimid film based coverlay

Features

- High bonding strength, good dimensional stability
- Flammability UL94V-0
- Excellent soldering reliability, chemical resistance and electrical properties
- Low adhesive flowing, good processability, suitable for both fast and traditional lamination style
- RoHs - free of Pb, Hg, Cd, Cr⁵⁺, PBB, PBDE etc.

Test item	Treatment conditions	Unit	Property data	
			Typical value	
			051813SR	101820SE
Peel strength (90°) ¹	A	N/mm	1,1	1,4
	288°C, 5s		0,9	1,3
Resin flow		mm	<0,15	<0,15
Solder float	300°C, 10s		pass	pass
Chemical resistance	2mol/l NaOH		pass	pass
	2mol/l HCl		pass	pass
	IPA		pass	pass
Dimensional MD Stability TD	E-0.5/150	%	-0,07	-0,05
			0,06	0,05
Resistivity	C-96/35/90	MΩ*m	2,0x10 ⁸	2,0x10 ⁸
Surface resistance	C-96/35/90	MΩ	2,0x10 ⁷	2,0x10 ⁷
Moisture absorption	E-1/105+D-24/23	%	0,9	1,1
Flammability	C-48/23/50		UL94 V-0	UL94 V-0

C = Humidity conditioning

D = immersion conditioning in distilled water

E = Temperature conditioning

1. Testing after laminating with shining side of copper foil in suitable condition

For Pressing cycles please see page 5.