ROGERS CORPORATION

Advanced Circuit Materials

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Preliminary Data Sheet

R/flex CRYSTAL® 7500 Series Circuit Materials
Flame Retardant Epoxy Adhesive System

Description

R/flex CRYSTAL® 7500 series flexible circuit materials from Rogers Corporation are Apical® NP film-based laminates, with rolled annealed copper foil, and coversheets ideally suited for constructing single and double sided flexible circuitry. The R/flex CRYSTAL system has been introduced to help meet the increasing performance and design demands imposed on today's flexible circuit materials. Inherent flame retardant performance, superior adhesion, dynamic flexibility, low and predictable dimensional change, resistance to harsh processing chemicals, and the clarity of the adhesive for automated processing and assembly make this system ideal for meeting the challenges of high density circuitry in dynamic or static applications.

Its epoxy resin adhesive system is uniquely formulated to exhibit excellent fill and flow characteristics, electrical properties, flexibility, and good chemical resistance. R/flex CRYSTAL 7500 series laminates and coverlayers are UL flame rated UL94 VTM-0 individually, and V-0 for laminate with coverfilm when used in combination, meeting the growing requirements of commercial applications.

The family of R/flex® flexible circuit materials is manufactured under rigorous process control. Process capabilities are continuously monitored for critical properties such as peel strength and dimensional stability.

Product Features

- High flex life provides for improved long-term reliability in demanding dynamic flexing applications
- Superior peel strength, superb dimensional stability, and outstanding flow control improve process yields and reduces fabrication cost
- Transparent, flame retardant adhesive provides a UL rated material that meets the needs of automated visual inspection and assembly processes

Applicable Specifications

Laminate - IPC-4204/2 (Supersedes IPC-FC-241/2, Rev C)
Coversheet - IPC-4203/2 (Supersedes IPC-FC-232/2 Rev C)
UL File - # E122972 UL Designator - "R/flex 7500"

Available Configurations -

Many available configurations are not standard. Please check with your Rogers representative.

Laminate

Copper weight: $^1/_3$, $^1/_2$, 1, or 2 oz./ft.^{2} treated rolled copper. (Other copper foils available on request).
Polyimide film thickness: 0.5mil (12.5µm), 1mil (25µm)only available at this time.

Adhesive thickness: Standard laminate adhesive thickness is 0.6 mil nominal.
Sizes: Laminate available in rolls:
- 19.68 in. (500mm) width

Laminate also available in additional slit widths and sheets upon request.

Laminate (L) Designation

R/flex 75X0-L-XXX

Side 1 copper thickness in oz./ft.^{2}
Polyimide film thickness in mils**
Side 2 copper thickness in oz./ft.^{2}

Coverlayer

Adhesive thickness: 0.5 - 2 mil. (13-51 µm)
Polyimide film thickness: 0.5mil (12.5µm), 1mil (25µm)only available at this time.
Sizes:
Coversheet available in rolls:
- 19.68 in. (500mm)

Coversheet also available in slit widths and sheets upon request.

Coverlayer (C) Designation

R/flex 7500-C-XX0

Side 1 adhesive in mils
Polyimide film thickness in mils**
Side 2 adhesive thickness in mils
** Use "H" for $^1/_2$ mil Polyimide.

Storage

R/flex CRYSTAL® 7500 series coversheet use B-staged adhesive systems that will retain their original properties for a minimum of nine months from the date of manufacture, when stored at 40-45°F (4-7°C) in their original packaging. When stored at 60°F (16°C), the shelf life is three months, from the date of manufacture. It is recommended that laminates be stored in a clean and dry area.

Typical Values vs. Specifications R/flex CRYSTAL® 7500 Series

	Units	Laminate (½ oz/0.5mil)	IPC spec (coverlayer and laminate)	Coverlayer (0.7mil/½ mil)	Test Method
Physical and Thermal Properties					
Flammability [1]		VTM-0	N/A	VTM-0	UL-94
Moisture absorption	%	1.4	4.0 max	1.4	IPC-TM-650, 2.6.2
Solder float (Method B)		PASS	PASS	PASS	IPC-TM-650, 2.4.13
Chemical Resistance		% (retained peel strength)			IPC-TM-650, 2.3.2
IPA		>95%	80%	>95%	
HCl		>95%	80%	>95%	
NaOH		>95%	80%	>95%	
Sequential		>95%	80%	>95%	

Mechanical Properties

	Units	IPC spec (laminate)	Laminate (½ oz/0.5mil)	IPC spec (coverlayer)	Coverlayer (0.7mil/½ mil)	Test Method
Dimensional stability	%					IPC-TM-650, 2.2.4
Method A (MD)		N/A		-0.20 max	-0.01	
Method B (MD)		- 0.15 max	+0.05	N/A		
Method C (MD)		-0.20 max	+0.05	N/A		
Peel Strength						IPC-TM-650, 2.4.9
As received (to treated copper)	lb/in (N/m)	4*(700)	6 (1050)	4*(700)	10 (1750)	
After solder float	lb/in (N/m)	3.5*(612)	6 (1050)	3.5*(612)	10 (1750)	
Flexural endurance	cycles	4000	>4000	N/A		IPC-TM-650, 2.4.3

* The IPC specification for peel strength of laminates as received with adhesive thickness below 1 mil (25 µm) is 4.0 PLI (700 N/m). For peel strength after solder with adhesive thickness below 1 mil (25 µm) is 3.5 PLI (612 N/m).

[1] Flammability rating of V-0 for the combination of laminate and coverlayer.

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