

R/flex CRYSTAL® 7700 Series Circuit Materials

Flame Retardant Epoxy Adhesive System

Description

R/flex® 7700 series flexible materials are an extension of Rogers R/flex CRYSTAL® epoxy adhesive technology, based on a new polyimide film used by Rogers Corporation. The copper clad laminates are offered with rolled annealed and electrodeposited copper foils well suited for constructing single and double sided flexible circuitry. The R/flex CRYSTAL adhesive system has been used extensively for many years and has been proven to meet the increasing performance and design demands imposed on today's flexible circuit materials. Inherent flame retardant performance, superior adhesion, high dynamic flexibility, resistance to harsh processing chemicals, and the clarity of the adhesive for automated processing and assembly, also make this adhesive system excellent for meeting the challenges of high density circuitry design for dynamic or static flex applications.

This epoxy adhesive system is uniquely formulated to exhibit superior fill and flow characteristics, electrical properties, flexibility, and good chemical resistance.

All R/flex CRYSTAL laminates, coverlayers and supported bonding films are UL flame rated UL94 VTM-0 individually, and V-0 for laminate with coverfilm when used in any combination, meeting the growing requirements of commercial applications.

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
 Coverlayer and Supported Bonding Film - IPC-4203/2
 UL File - # E122972

Available Configurations -

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

Laminate

Copper weight: 1/2 (13µm) and 1(25 µm) oz./ft.² treated rolled copper and electrodeposited coppers are available. Other coppers available upon request.

Polyimide film thickness: 1/2 (13µm), 1 mil (25µm)

Adhesive thickness: Standard laminate adhesive thickness is 0.6 mil (15µm) nominal

Sizes: Laminate available in rolls:

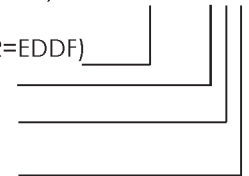
- 19.68" (500mm) maximum width

Laminate also available in additional slit widths and sheets upon special order

Laminate (L) Designation

Copper Type (9= black RA, 1=ED, non-standard material 3=pink RA, 2=EDDF)
 Side 1 copper thickness
 Polyimide film thickness
 (1 = 1 mil, H = 1/2 mil)
 Side 2 copper thickness

R/flex 77X0-L-XXX



Coverlayer and Supported Bonding Film

Adhesive thickness: 0.5, 0.7, 1 and 2 mil (13, 18, 25 and 51 µm) nominal

Polyimide film thickness: 1/2 (13µm), 1 mil (25µm)

Sizes:

Coverlayer and Supported Bonding Film available in rolls:
 • 19.68" (500mm) wide maximum. Also available in other slit widths or in sheets upon special order.

Coverlayer (C) and Supported Bonding Film (B) Designation

Side 1 adhesive in mils
 Polyimide film thickness
 (1 = 1 mil, H = 1/2 mil)
 Side 2 adhesive thickness in mils

R/flex 7700-C-XX0
 7700 -B- XXX



Storage

R/flex CRYSTAL® coverlayer and supported bonding film use a B-staged adhesive system that will retain their original properties for a minimum of nine months from the date of manufacture, when stored at 40°F (4°C) or less in their original packaging. When stored above 40°F (4°C), the shelf life is substantially reduced. It is recommended that laminates be stored in a clean and dry area.

Typical Values vs. Specifications

R/flex CRYSTAL® 7700

	Units	Laminate 77X0L110	IPC spec	Coverlayer 7700C110	Test Method
Electrical Properties					
Dielectric constant	@ 1 MHz	<3.6	4.0 max	<3.6	IPC-TM-650, 2.5.5.3
Dissipation factor	@ 1 MHz	0.026	0.04 max	0.026	IPC-TM-650, 2.5.5.3
Dielectric strength	volts/mil	>6000	2000 min	>6000	ASTM-D-149
Volume resistivity	megohms/cm	10 ¹⁰	10 ⁶ min	10 ¹⁰	IPC-TM-650, 2.5.17
Surface resistance	megohms	10 ⁷	10 ⁴ min	10 ⁷	IPC-TM-650, 2.5.17
Moisture-insulation resistance	megohms	10 ⁹	10 ³ min	10 ⁹	IPC-TM-650, 2.6.3.2
Physical and Thermal Properties					
Flammability ⁽¹⁾		VTM-0	N/A	VTM-0	UL-94
Moisture absorption	%	1.5	4.0 max	1.5	IPC-TM-650, 2.6.2
Solder float (Method B) 550°F(288°C)/10 second		PASS	PASS	PASS	IPC-TM-650, 2.4.13
Maximum operating temperature (MOT)	°C	115°C		115°C	UL746E
0.5 mil base polyimide film materials are not rated for MOT					
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%	

	Units	IPC spec (laminate)	Laminate 77X0L110	IPC spec (coverlayer)	Coverlayer 7700C110	Test Method
Mechanical Properties						
Dimensional stability	%					IPC-TM-650, 2.2.4
Method A (MD)		N/A		±0.20 max	-0.05	
Method B (MD)		±0.15 max	-0.10	N/A		
Method C (MD)		±0.20 max	-0.15	N/A		
Peel Strength						IPC-TM-650, 2.4.9
As received						
(to treated copper)	lb/in (N/m)	4* (700)	>8 (1400)	8 (1400)	>10 (1750)	
After solder float	lb/in (N/m)	3.5*(612)	>6 (1050)	7 (1225)	>9 (1575)	
Flexural endurance	cycles	1000 min	>2000	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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