ROGERS CORPORATION

Advanced Circuit Materials

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Preliminary Data Sheet

R/flex JADE™ Series

Halogen-Free Adhesive System
Flexible Coverlayer and Bonding Film

R/flex JADE™ series flexible circuit materials are the next generation of the industry-leading R/flex CRYSTAL® epoxy adhesive system. Environmentally friendly, these materials are halogen-free, lead-free, and flame retardant. They allow our customers to meet the increasing environmental requirements imposed upon commercial applications worldwide without compromising the performance required in today's demanding flexible circuit designs.

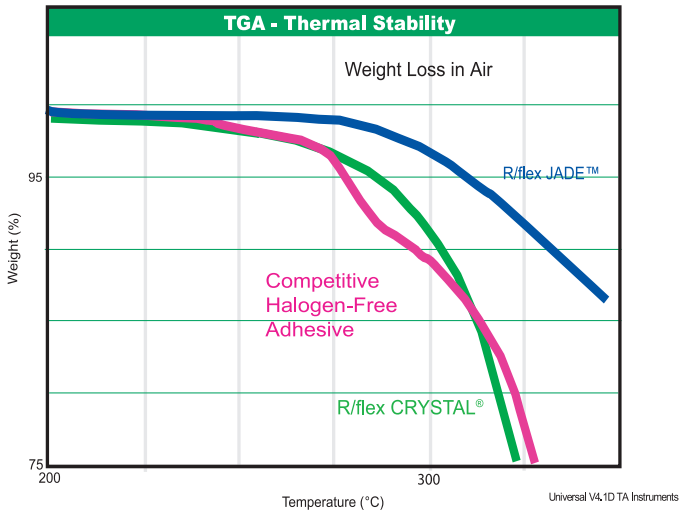
The unique adhesive formulation exhibits excellent fill and flow characteristics, eliminating voiding between conductors in low-pressure areas and excelling in multilayer applications. R/flex JADE coverlayers and bonding film display superior thermal stability and are robust enough to withstand multiple passes through lead-free processing.

Product Features & Benefits:

- Green and halogen-free epoxy system
- High Tg (glass transition temperature) allows for higher temperature exposures, higher yields in multilayer builds, and better flex life despite rigorous processing conditions
- Superior thermal stability allows R/flex JADE material to withstand multiple passes through lead-free soldering
- High flow adhesive provides fill in lower pressures areas, eliminating voiding between conductors
- Transparent adhesive system facilitates optical inspection

Applications:

R/flex JADE coverlayer and bonding film are formulated to accommodate the most technically demanding circuit applications: hard disk drives, cellular phones, laptop computers, personal digital assistants, semiconductor packages, and many others.

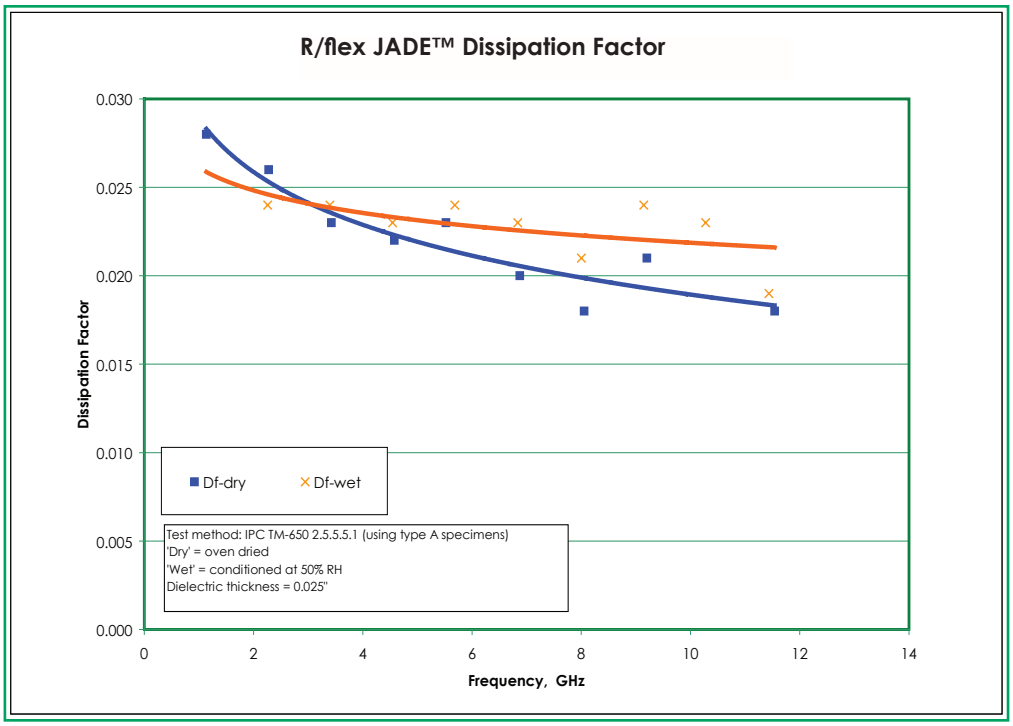


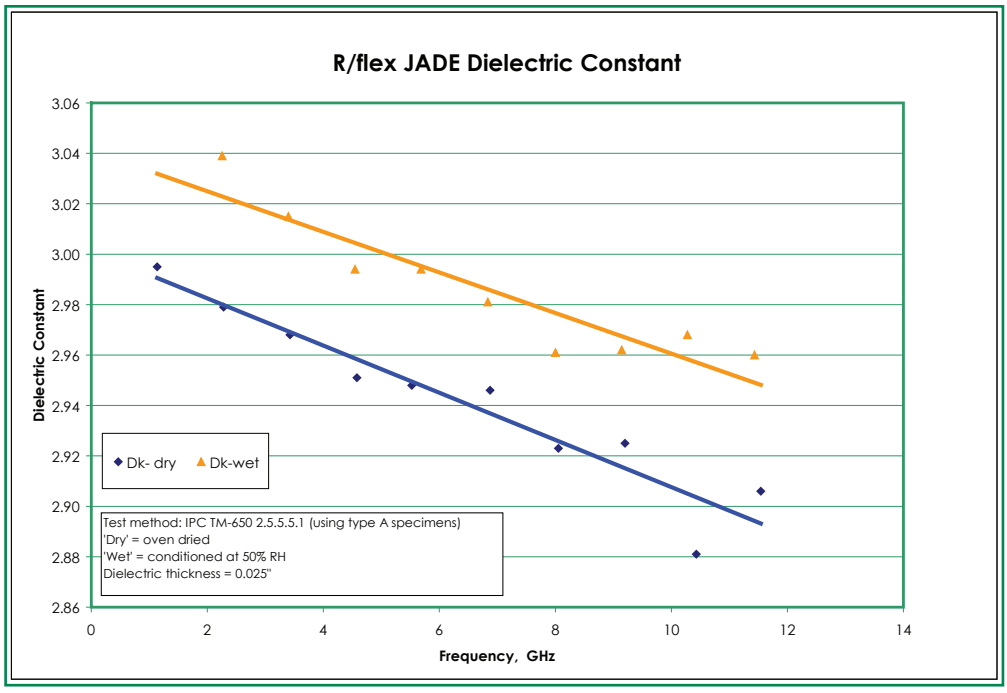
Typical Values

R/flex JADE™ - Coverlayer and Bonding Film

Property		Test	Details		Units	Coverfilm		Freefilm
						J500CJH0	J500C110	J00B100
						0.7 mil adh/0.5 mil PI	1.0 mil adh/1 mil PI	1 mil adhesive
Mechanical Properties								
Peel Strength		IPC-TM-650 method 2.4.9	Method A (as received)		kN/m	1.4	1.4	1.4
			After solder float			1.4	1.4	1.3
Solder Resistance		IPC-TM-650 method 2.4.13	288°C, 10 sec.			PASS	PASS	PASS
			288°C, 10 min.			PASS	PASS	PASS
Dimensional Stability		IPC-TM-650 method 2.2.4	Method A	MD	%	0.01	0.00	
				TD		0.08	0.01	
Flexural Endurance		JIS C 6471	MIT Test (w/single sided laminate)	R=0.38mm	Cycles	3955		
Electrical Properties								
Dielectric Constant		IPC-TM-650 method 2.5.5.3	@ 1 MHz			3.2		
			@ 1 GHz			3.2		
Dissipation Factor			@1MHz			0.02		
Surface Resistance		IPC-TM-650 method 2.5.17			megohms	$>10^9$	$>10^9$	$>10^9$
Volume Resistance					megohms-cm	$>10^7$	$>10^7$	$>10^7$
Dielectric Strength		ASTM D-149			V/mil	5230	5230	3840
Physical Properties								
Adhesive Tg					°C	>85		
Chemical Resistance					%	100		
Flammability		UL94	File #E122972			VTM-0		
[1]Polyimide Performance	Tensile Modulus	ASTM D-882	@20°C		GPa	4.1		N/A
	Tensile Strength				MPa	303		N/A
	Elongation				%	90		N/A
	CTE	TMA	100 to 200°C		ppm/°C	16		N/A
	CHE	HMA	@50°C		ppm/RH	13		N/A
	Humidity Absorption	ASTM D-570	D-24/20		%	2.5		N/A

Note:
1. Polyimide properties based on data sheet information provided by Kaneka for the APICAL NP film offering.





Environmental Standards:
R/flex JADE™ products contain no cadmium, lead, mercury, hexavalent chromium compounds, PBBs, PBDEs and meet or exceed the following industry standards:

- IEC and JPCA halogen-free requirements
- RoHS directives

Part Number Description:

Coverlayer (C) Designations	**R/flex J500C X X 0**
Adhesive thickness (J=0.7 mil and 1=1 mil) Polyimide film thickness (H=0.5 mil and 1=1 mil)	
Bonding Film (B) Designations	**R/flex J000B X 0 0**
Adhesive thickness (J=0.7 mil and 1=1 mil)	

Material Type	Rogers Part Number	Polyimide Thickness		Adhesive Thickness	
		mil	µm	mil	µm
Coverlayer	J500CJH0	0.5	12.5	0.7	20
	J500C110	1	25	1	25
Bonding Film	J000B100	0	0	1	25

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

Material Construction Information:
R/flex JADE coverlayer products are constructed with a base dielectric polyimide of Kaneka APICAL® NP film and a standard release sheet of opaque polypropylene encapsulated white paper carrier. Bonding films are manufactured with polypropylene encapsulated paper and a polyester release sheet.

All R/flex flexible circuit materials are manufactured under rigorous process control where process capabilities are continuously monitored for all critical properties such as peel strength and dimensional stability.

Storage Conditions:
R/flex JADE coverlayer and bonding film use B-staged adhesive systems that will retain their original properties for a minimum of six months from the date of manufacture when stored at or below 4°C (40°F) in their original packaging. When stored at 16°C (60°F), the shelf life is three months from the date of manufacture.

Applicable Specifications:
Coverlayer: IPC-4203 / 2
Unsupported Bonding Film: IPC- 4203 / 19

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