

R/flex® 2005 Circuit Material Flame Retardant Material System

Description

Formulated in response to industry requirements for UL listed materials, R/flex® 2005 circuit material has a flame rating of UL 94 V-O/VTM-0 and a thermal index of 105°C (221°F). The R/flex 2005 material system, consisting of Kapton® polyimide film based laminate* with rolled annealed copper foil, cover sheet, and bonding film, offers wide process latitude, high bond strength and solvent resistance. Improved electrical performance is attained in critical applications with its low moisture absorption and closely controlled adhesive thickness.

The family of R/flex flexible circuit materials is manufactured under vigorous process control. Process capabilities are continuously monitored for all critical properties, such as peel strength and dimensional stability. Our manufacturing process assures that R/flex circuit materials are as consistent from lot-to-lot as they are from roll-to-roll and within a roll.

* Laminates use 0.5, 1 and 2 mil Kapton KN film or 3 and 5 mil Kapton HN film. All coverfilms and supported bonding films use Kapton HN polyimide films.

Product Features

- UL 94 V-O/VTM-0 flame rating designed to meet industry requirements for UL-rated materials
- High bond strength and excellent solvent resistance provides wide process latitude
- Low moisture absorption and uniform adhesive thickness for improved electrical performance in critical controlled impedance applications
- Laminates available in rolls for economic continuous roll-to-roll fabrication
- Contains no Biphenyls or Biphenyloxy compounds, meeting emerging European standards for environmental safety. No CFC's are contained in or used in the manufacture of this material

Applicable Specifications

Laminate - IPC-4204/22
 Coversheet and Bonding Film IPC-4203/22
 UL File - # E122972

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 special order.)

Polyimide film thickness:

1/2, 1, 2, 3, or 5 mils (13, 25, 50, 75, 125 µm)

Adhesive Thickness: Standard laminate adhesive thickness is 1 mil nominal. (Adhesive thickness of 0.5 mil available on special order)

Sizes: Laminate available in rolls:

- 24" (610mm) wide

Laminate also available in sheets upon special order.

1/3* oz. - available single sided laminate only.

Laminate Designation (K or L)

R/flex 2005-L-XXX

3 and 5 mil Kapton use L, others use K

Side 1 copper thickness in oz./ft.²

Polyimide film thickness in mils**

Side 2 copper thickness in oz./ft.²

Coversheet and Bonding Film

Adhesive thickness: 1/2, 1, 2, 3, 4 mils

(13, 25, 50, 75, 100 µm)

Polyimide film thickness: 1/2, 1, 2, 3 or 5 mils

(13, 25, 50, 75, 125 µm)

Sizes:

Coversheet and Bonding Film available in rolls:

- 24" (610mm) wide

Coversheet and Bonding Film also available in sheets upon special order.

Coversheet (C) and Bonding Film (B) Designation

R/flex 2005-C-XX0

B-XXX

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® 2005 coversheets and bonding films use B-staged adhesive systems that will retain their original properties for twelve months if stored at 40-70°F (4-21°C) in their original packaging. It is recommended that laminates be stored in a clean and dry area.

	Units	Laminate (1oz./2 mil*- 1oz/50µm)	Coversheet (2 mil/50µm)	Test Method
Electrical Properties				
Dielectric constant	@ 1 MHz	3.8	3.8	IPC-TM-650, 2.5.5.3
Dissipation factor	@ 1 MHz	0.01	0.01	IPC-TM-650, 2.5.5.3
Dielectric strength	volts/mil	>5600	>5600	ASTM-D-149
Insulation resistance	megohms	10 ⁷	10 ⁷	IPC-TM-650, 2.6.3.2
Volume resistivity	megohms/cm	10 ⁸	10 ⁸	IPC-TM-650, 2.5.17
Surface resistance	megohms	10 ⁴	10 ⁴	IPC-TM-650, 2.5.17
Moisture-insulation resistance	megohms	10 ⁵	10 ⁵	IPC-TM-650, 2.6.3.2
Physical and Thermal Properties				
Flammability		V-0/VTM-0	V-0/VTM-0	UL-94
Moisture absorption	%	2.6	2.6	IPC-TM-650, 2.6.2
Solder float (Method A & B)		PASS	PASS	IPC-TM-650,2.4.13
Dimensional stability	%			IPC-TM-650, 2.2.4
Method A (MD)		0.02	-0.04	
Method B (MD)		-0.07	NA	
Service temperature	°C	105	105	UL746E
Mechanical Properties				
Peel strength				IPC-TM-650, 2.4.9
As receive(to treated copper)	lb./in. (N/m)	10 (1750)	15 (2625)	
After solder float	lb./in. (N/m)	8 (1400)	10 (1750)	

*(Kapton KN film)

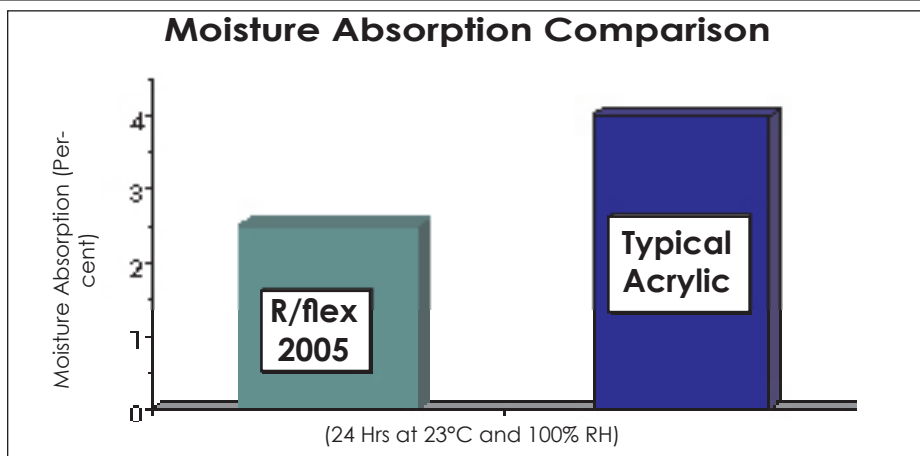
Typical values are a representation of an average value for the population of the property. For specification values contact Rogers Corporation.

Coversheet Lamination Conditions

Temperature:	285-390°F (140-200°C)
Time:	45-120 minutes (at temperature)
Pressure:	300 - 400 psi (200 - 250 psi autoclave) [21.1-28.1 Kg/cm ² (14.6-17.1 Kg/cm ² autoclave)]

- Cold start, apply pressure first
- Ramp rate - 10°F/minute (5°F/minute for autoclave)
- Cool down to 100°F - 120°F (38°C - 49°C) before releasing pressure

These times and temperatures are suggested as a starting point in the process of determining conditions suitable for bonding coversheet materials to copper clad laminate. Please note that conditions may vary with the equipment used, and it is expected that some optimization will be required.



The information in this data sheet is intended to assist you in designing with Rogers' circuit materials. It is not intended to and does not create any warranties express or implied, including any warranty of merchantability or fitness for a particular application. The user should determine the suitability of Rogers' circuit materials for each application.

R/flex is a licensed trademark of Rogers Corporation.
Kapton is a registered trademark of DuPont de Nemours and Co.
©1998, 2002, 2008 Rogers Corporation, Printed in U.S.A.
Revised 02/2008, -0208-0.5-CC, Publication# 14-009