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 coversheets are UL ﬂame rated UL94 VTM-0 individually, and V-0 for laminate with cover ﬁlm 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 ½ 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

<table>
<thead>
<tr>
<th>Physical and Thermal Properties</th>
<th></th>
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<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Flammability (1)</td>
<td>VTM-0</td>
<td>N/A</td>
<td>VTM-0</td>
<td>UL-94</td>
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<tr>
<td>Moisture absorption</td>
<td>%</td>
<td>1.4</td>
<td>4.0 max</td>
<td>1.4</td>
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<tr>
<td>Solder float (Method B)</td>
<td>PASS</td>
<td>PASS</td>
<td>PASS</td>
<td>IPC-TM-650, 2.4.13</td>
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<tr>
<td>Chemical Resistance</td>
<td>% (retained peel strength)</td>
<td>&gt;95%</td>
<td>80%</td>
<td>&gt;95%</td>
</tr>
<tr>
<td>IPA</td>
<td>&gt;95%</td>
<td>&gt;95%</td>
<td>&gt;95%</td>
<td></td>
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<tr>
<td>HCl</td>
<td>&gt;95%</td>
<td>&gt;95%</td>
<td></td>
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<tr>
<td>NaOH</td>
<td>&gt;95%</td>
<td>&gt;95%</td>
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<tr>
<td>Sequential</td>
<td>&gt;95%</td>
<td>&gt;95%</td>
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</table>

### Mechanical Properties

<table>
<thead>
<tr>
<th>Mechanical Properties</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Dimensional stability</td>
<td>%</td>
<td>N/A</td>
<td>-0.20 max</td>
<td>-0.01</td>
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<tr>
<td>Method A (MD)</td>
<td>N/A</td>
<td>-0.20 max</td>
<td>N/A</td>
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<tr>
<td>Method B (MD)</td>
<td>-0.15 max</td>
<td>+0.05</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Method C (MD)</td>
<td>-0.20 max</td>
<td>+0.05</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Peel Strength</td>
<td></td>
<td>IPC-TM-650, 2.4.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>As received</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(to treated copper)</td>
<td>lb/in (N/m)</td>
<td>4*(700)</td>
<td>6 (1050)</td>
<td>4* (700)</td>
</tr>
<tr>
<td>After solder float</td>
<td>lb/in (N/m)</td>
<td>3.5*(612)</td>
<td>6 (1050)</td>
<td>3.5* (612)</td>
</tr>
<tr>
<td>Flexural endurance</td>
<td>cycles</td>
<td>4000</td>
<td>&gt;4000</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*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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