



**IPC-4203A**  
**Amendment 1**  
**2014 - October**  
**Cover and Bonding Material for**  
**Flexible Printed Circuitry**

*A standard developed by IPC*

*Association Connecting Electronics Industries*



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**Standards Should:**

- Show relationship to Design for Manufacturability (DFM) and Design for the Environment (DFE)
- Minimize time to market
- Contain simple (simplified) language
- Just include spec information
- Focus on end product performance
- Include a feedback system on use and problems for future improvement

**Standards Should Not:**

- Inhibit innovation
- Increase time-to-market
- Keep people out
- Increase cycle time
- Tell you how to make something
- Contain anything that cannot be defended with data

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# Cover and Bonding Material for Flexible Printed Circuitry

Replace Table 1-5 (Designation "V" added)

Table 1-5 Adhesive Type Designation

Designation	Adhesive Type
L	Epoxy
M	Acrylic
N	Polyester
P	Butyral phenolic
R	Fluorinated Polymer
S	Nitrile phenolic
T	Polyimide
V	Polyamide-imide

Add /25 Header to:

## Specification Sheets for Adhesive Coated Dielectric Films or Adhesive Bonding Films

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<b>SPECIFICATION SHEET #</b>	: <b>IPC-4203/25</b>
<b>SUPERCEDES</b>	: <b>NONE</b>
<b>MATERIAL TYPE</b>	: <b>UNSUPPORTED POLYAMIDE-IMIDE ADHESIVE</b>
<b>MATERIAL DESIGNATION</b>	: <b>NON0V__</b>

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**Add New Specification Sheet /25****Revision Date: October 2014****Specification Sheet**

**Specification Sheet #** : IPC-4203/25  
**Supersedes** : None  
**Material Type** : Unsupported Polyamide-imide Adhesive  
**Material Designation** : N0N0V\_\_

Property to be tested	Requirement	Units	Test Method	Reference Paragraph	
1. Wrinkles, Creases, Streaks and Scratches	Pass	—	Visual	3.5.2	
2. Inclusions	Pass	—	Visual, ASTM D-149	3.5.3	
3. Voids	Pass	—	2.1.13	3.5.4	
4. Holes, Tears and Delaminations	Pass	—	Visual	3.5.5	
5. Dimensional Stability, maximum	N/A	%	2.2.4, Method A	3.7.1	
6. Peel Strength, minimum** As Received After Solder Float After Temperature Cycling	t1 N/A N/A N/A	t2 700 [4] 700 [4] DBD	N/m width [lb/in width]	2.4.9 Method A or B Method C or D Method E or F	3.7.2.1 3.7.2.2 3.7.2.3
7. Flow, maximum	5:1	—	2.3.17.1	3.7.3	
8. Volatile Content, maximum	3	%	2.3.37	3.7.4	
9. Chemical Resistance	80	%	2.3.2, Method A	3.8.1	
10. Solder Float	N/A Pass	—	2.4.13 Method A Method B	3.8.2	
11. Permittivity, range At 1 MHz At 1 GHz At 10 GHz	3.1 - 3.7 2.9 - 3.5 2.8 - 3.4	— — —	2.5.5.3 2.5.5.9 (ASTM D-2520 <sup>†</sup> ) 2.5.5.5 (ASTM D-2520 <sup>†</sup> )	3.9.1	
12. Loss Tangent, maximum At 1 MHz At 1 GHz At 10 GHz	0.02 0.03 0.03	— — —	2.5.5.3 2.5.5.9 (ASTM D-2520 <sup>†</sup> ) 2.5.5.5 (ASTM D-2520 <sup>†</sup> )	3.9.2	
13. Volume Resistivity (Damp Heat), minimum*	10 <sup>6</sup>	MΩ-cm	2.5.17	3.9.3	
14. Surface Resistance (Damp Heat), minimum*	10 <sup>7</sup>	MΩ	2.5.17	3.9.4	
15. Dielectric Strength, minimum	120 [3048]	V/μm [V/mil]	ASTM D-149	3.9.5	
16. Fungus Resistance	Non-nutrient	—	2.6.1	3.10.1	
17. Moisture Absorption, maximum	1.1	%	2.6.2	3.10.2	
18. Flammability, minimum	Not Rated	—	UL-94	3.10.3	
19. Service Temperature, minimum	DBD	°C [°F]	2.6.21	3.10.4	
20. Moisture and Insulation Resistance, minimum	DBD	MΩ	2.6.3.2	3.10.5	

N/A = Not applicable

DBD = Data being developed

<sup>†</sup>ASTM D-2520 is an optional test method.

\*Data indicated is for 50% relative humidity and 23 ± 1°C [73.4 ± 1.8°F].

**Important:** To material suppliers, please submit data to IPC with test conditions of 35°C [95.0°F] at 95% humidity.

\*\*Represents values for peel with bonding to treated side of copper. Values are halved when bonding to untreated copper surface.

\*\*\*Material is available with flame retardant and non-flame retardant adhesive. See 3.10.3.

<sup>††</sup>Flexible metal-clad dielectric materials with any of the following thickness:

- a) Dielectric or base <0.025 mm [<0.001 in].
- b) Adhesive thickness <0.025 mm [<0.001 in].

<sup>†††</sup>Flexible metal-clad dielectric materials with all the following thickness:

- a) Dielectric or base ≥0.025 mm [≥0.001 in].
- b) Adhesive thickness ≥0.025 mm [≥0.001 in].