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IPC-4411A

Specification and Characterization Methods for Nonwoven Para-Aramid Reinforcement

Developed by the Nonwoven Aramid Reinforcement Task Group (3-12b) of the Strategic Components of Base Materials Subcommittee (3-12) of the Printed Board Base Materials Committee (3-10) of IPC

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Users of this publication are encouraged to participate in the development of future revisions.

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1 SCOPE

This specification covers the requirements for nonwoven para-aramid reinforcement used in the manufacture of base materials primarily for rigid or multilayer printed boards in electrical and electronic applications.

1.1 Purpose This specification determines the nomenclature, definitions, general comments, and physical requirements for reinforcement made from nonwoven para-aramid fibers.

1.2 Classification This specification provides physical characteristics of the reinforcement required to meet the design and performance requirements of the printed wiring boards (PWBs).

At the end of this document are specification sheets, which provide minimum performance levels for physical characteristics of the reinforcements. These are useful for identifying degrees of precision needed to meet design/performance requirements of the PWB of current commercially available nonwoven para-aramid reinforcements.

In the event of conflict between design requirements and levels as defined in this specification, design requirements take precedence.

2 APPLICABLE DOCUMENTS

2.1 IPC[1]

IPC-T-50 Terms and Definitions for Interconnecting and Packaging Electronic Circuits

IPC-QL-653 Qualification of Facilities that Inspect/Test Printed Boards, Components, and Materials

IPC-9191 General Requirements for Implementation of Statistical Process Control (SPC)

2.2 National Conference of Standards Laboratories (NCSL)[2]

ANSI/NCSL Z540-1 General Requirements for Calibration Laboratories and Measuring Test Equipment

2.3 TAPPI (Technical Association Pulp & Paper Industry)[3]

T 410 Grammage of Paper and Paperboard (Weight Per Unit Area)

T 411 Thickness (Caliper) of Paper, Paperboard, and Combined Board

T 437 Dirt in Paper and Paperboard

T 456 Wet Tensile Breaking Strength of Paper and Paperboard

T 494 Tensile Properties of Paper and Paperboard (Using Constant Rate of Elongation Apparatus)

T 1007 Sample Location

2.4 International Standards[4]

ISO 10012-1 Quality Assurance Requirements for Measurement Equipment, Part 1 - Meteorological Confirmation System for Measuring Equipment

2.5 Japanese Industrial Standards (JIS)

JIS P8113 Paper and Board – Determination of Tensile Properties

JIS P8118 Test Method for Thickness and Bulk Density of Paper and Paperboard

JIS P8124 Determination of Basis Weight of Paper (Reaffirmed:1995)

JIS P8110 Conditioning of Paper for Test

JIS P8145 Testing Method for Dirt in Paper and Paperboard

3 REQUIREMENTS

3.1 Terms and Definitions Terms and definitions **shall** be in accordance with IPC-T-50, TAPPI, and JIS documents.

3.1.1 Para-Aramid Fiber A continuous filament yarn precision cut to a specified length, which is used for printed wiring board applications. Para-aramid is the generic name

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1. www.ipc.org
2. www.ncsli.org
3. www.tappi.org
4. www.ansi.org