IPC-HDBK-620

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Handbook and Guide to IPC-D-620 and IPC/WHMA-A-620

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Association Connecting Electronics Industries

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Developed by the IPC-HDBK-620 Handbook Task Group (7-31h) and Wire Harness Design Task Group (7-31k) of the Product Assurance Committee (7-30) of IPC

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

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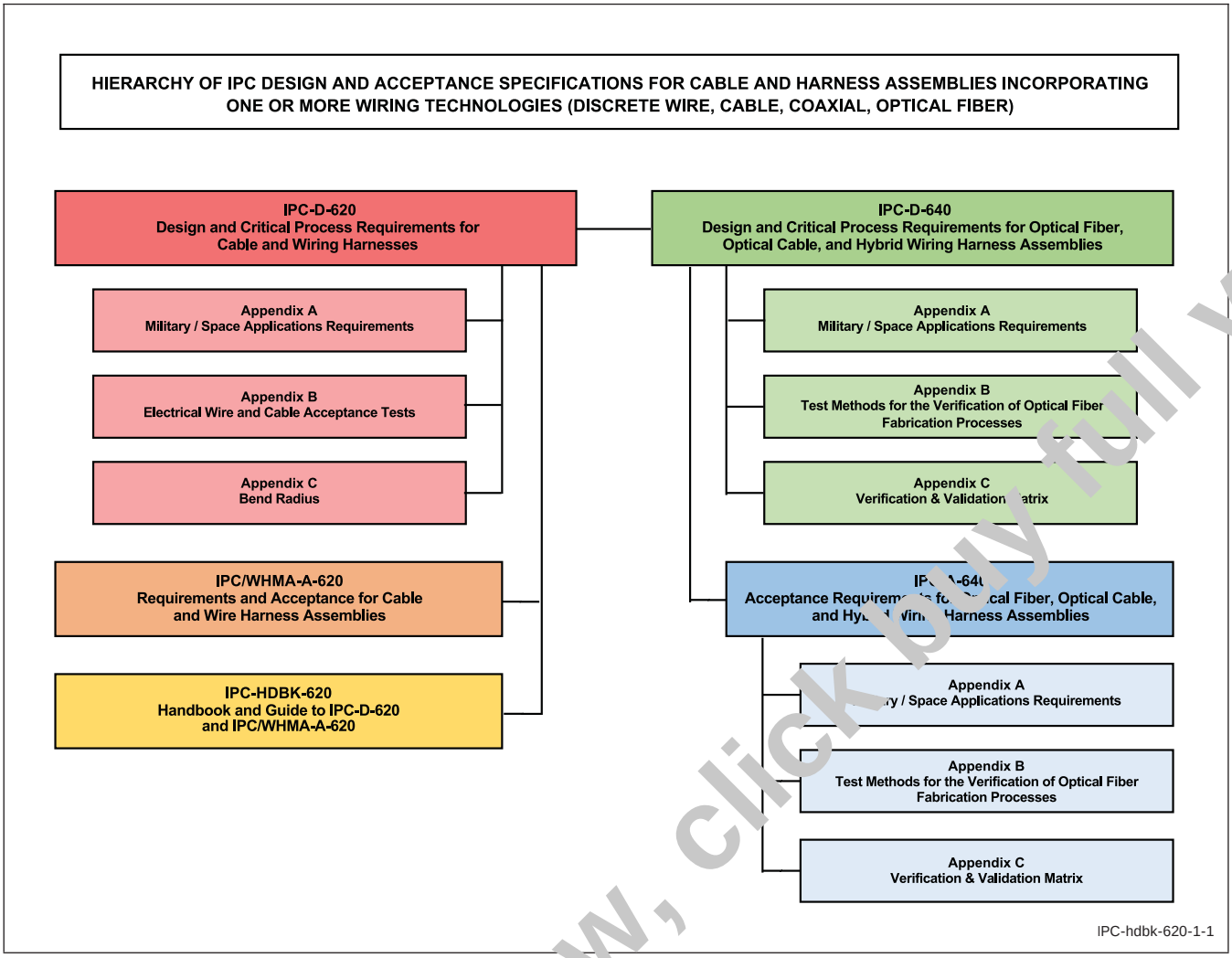

Figure 1-1 Hierarchy of IPC Design and Acceptance Specifications for Cable and Harness Assemblies Incorporating Oneor More Wiring Technologies (Discrete Wire, Cable, Coaxial, Optical Fiber)

This handbook is intended to provide information on the design requirements for cable and wiring harness design, to the extent that they can be applied to the broad spectrum of cable and wiring harness design.

It is therefore crucial that decisions concerning the choice of product classification, wiring technology, connectorization requirements, and performance and reliability requirements be made as early as possible.

As wiring and connector technology changes, specific requirements will be updated or new requirements added to the document set.

The IPC invites input on the effectiveness of the documentation and encourages User response through completion of "Suggestions for Improvement" forms located at the end of each document.

Acknowledgment

Members of the IPC-HDBK-620 Handbook Task Group and Wire Harness Design Task Group worked together to develop this document. We thank them for their dedication and service to this effort. Any document involving a complex technology draws material from a vast number of sources across many continents. While the principal members of the IPC-HDBK-620 Handbook Task Group (7-31h) and Wire Harness Design Task Group (7-31k) of the Product Assurance Committee (7-30) are shown below, it is not possible to include all of those who assisted in the evolution of this standard. To each of them, the members of the IPC extend their gratitude.

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1 GENERAL

Cables and wiring harnesses are equivalent to the human circulatory and nervous system. They deliver energy, transmit command and control instructions, and collect and distribute sensory data describing not only the environment external to the system, but the health and status of the system itself.

Often the most overlooked, ignored, and ''taken for granted'' component in a design, high quality cables and wiring harnesses are essential to the performance and reliability of any electrical/electronic system.

It is the Designer's and Supplier's responsibility to ensure that the technical issues associated with the design and manufacture of cable assemblies and wiring harnesses are conveyed to the User, and that a dialogue is established, so that appropriate and timely decisions are made commensurate with realistic expectations and reality.

1.1 Scope This Handbook is a companion reference to IPC-D-620 ''Design and Critical Process Requirements for Cable and Wiring Harnesses'' and IPC/WHMA-A-620 ''Requirements and Acceptance for Cable and Wire Harness Assemblies'' and is intended to provide supporting information, guidance, and technical insight into the design and acceptance requirements for cable and wire harness assemblies.

The intent of this Handbook is to capture ''how and why'' information and provide additional technical rationale for the specification limits, acceptance criteria, as well as how those specifications and criteria interrelate. In addition, other supporting information is provided to give a broader understanding of the process considerations needed for the design and production of acceptable hardware.

The target user of this Handbook is a process or manufacturing engineer.

Reference materials listed in this text are among those considered as required reading. The User is encouraged to obtain all relevant referenced materials as this document cannot (nor can any single document) cover every material, process, environment, performance, or safety aspect that affect a given design.

This handbook addresses a wide range of technologies and processes used in cable and wiring harness assemblies, including optical fiber technology, adhesives and polymerics, torque, test, etc. Reference materials listed in this text are recommended for reading to obtain a complete understanding of the topics presented. The User is encouraged to obtain all relevant referenced materials as this document cannot (nor can any single document) cover every material, process, environment, performance, or safety aspect that affect a given design.

It is not enough to understand the properties of the various components, materials and processes; the user **should** understand what is to be achieved by the set of selected components, materials, and processes within the end use environment and how to verify that the desired results have been realized.

This document is intended to be used as a reference only. It is the responsibility of the user to determine the suitability of the cable and/or wire harness assembly design as a functional system in the intended end use application.

1.2 Purpose IPC-HDBK-620 ''Handbook and Guide to IPC-D-620 and IPC/WHMA-A-620'' is the cable and wiring harness handbook companion to IPC-D-620 ''Design and Critical Process Requirements for Cable and Wiring Harnesses'' and IPC/WHMA-A-620 ''Requirements and Acceptance for Cable and Wire Harness Assemblies.''

For purposes of this document:

- The Designer is the design agent for the User.
- The User is the individual, organization, company, contractually designated authority, or agency responsible for the procurement or design of electrical/electronic/electromechanical (EEE) hardware, and having the authority to define the class of equipment and any variation or restrictions to the requirements of this document (e.g., the originator/custodian of the contract detailing these requirements). The User is considered the Design Authority.
- The Supplier is considered the individual, organization or company which provides the Manufacturer (assembler) components (e.g., electrical, electronic, electromechanical, mechanical, printed boards, etc.) and/or materials (e.g., solder, flux, cleaning agents, etc.).
- The Manufacturer is considered the entity that provides a service or product to the User.