IPC-D-620A

2021 - December

Design and Critical Process Requirements for Cable and Wiring Harnesses

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- Contain simple (simplified) language
- Just include spec information
- Focus on end product performance
- Include a feedback system on use and problems for future improvement

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- Increase time-to-market
- Keep people out
- Increase cycle time
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- Contain anything that cannot be defended with data

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Design and Critical Process Requirements for Cable and Wiring Harnesses

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

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

Contact:

IPC
3000 Lakeside Drive, Suite 309S
Bannockburn, Illinois
60015-1219
Tel 847 615.7100
Fax 847 615.7105

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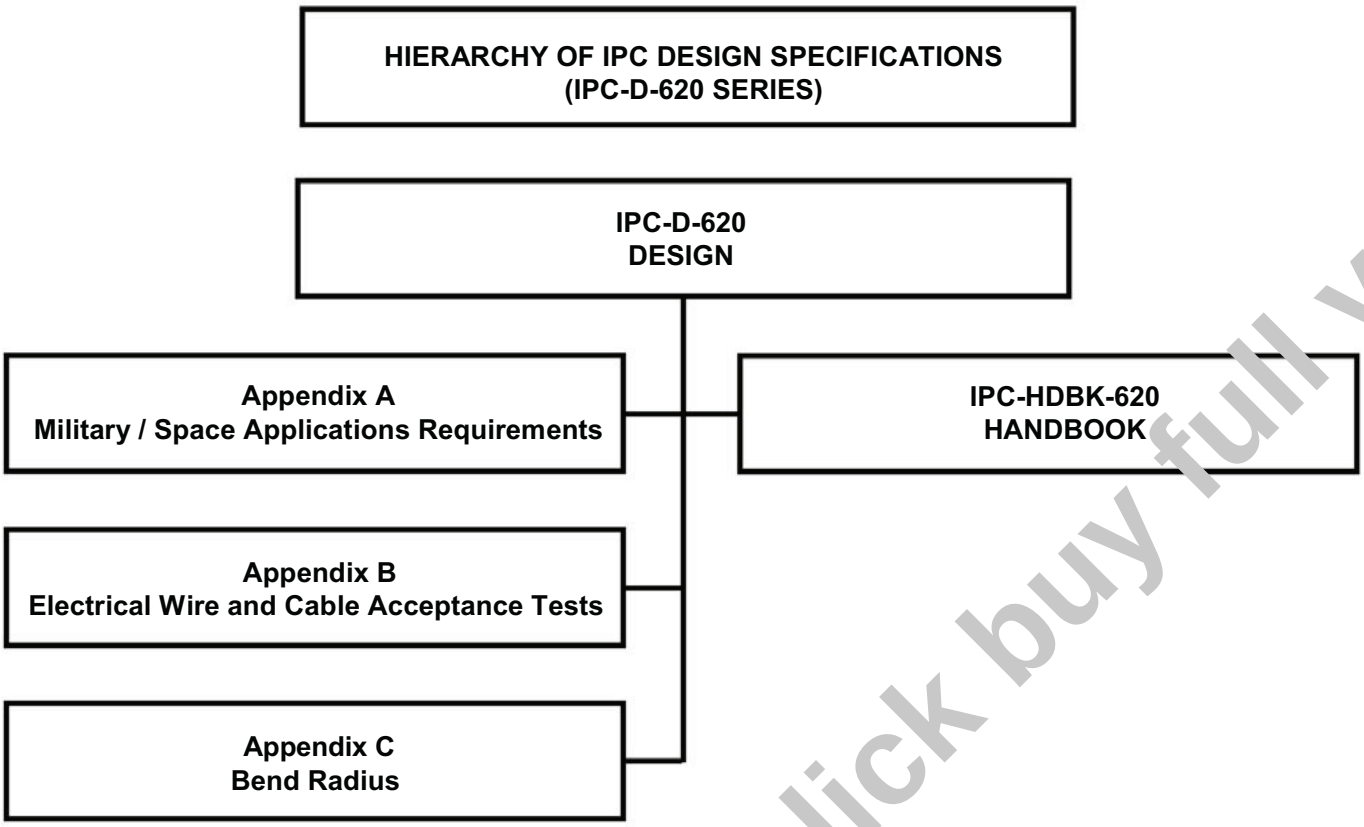

FORWARD

This standard 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.

IPC-D-620 is supplemented by Appendices A-C and a handbook (IPC-HDBK-620), which provide the engineering rationale and technical guidance on cable and wiring harness design. The User needs, as a minimum, the Design Requirements document (IPC-D-620), and the engineering description of the final product.

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

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Acknowledgment

Members of the Wire Harness Design Task Group worked 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 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.

Product Assurance Committee

Chair
Robert W. Cooke
NASA Johnson Space Center

Vice-Chair
Debbie Wade
Advanced Rework Technology

Wire Harness Design Task Group

Chair
Robert W. Cooke
NASA Johnson Space Center

Vice-Chair
Sean Keating
Amphenol Ltd (UK)

Technical Liaison of the IPC Board of Directors

Bob Neves
Microtek (Changzhou) Laboratories

Members of Wire Harness Design Task Group

Dominik Alder
Lockheed Martin Corporation

Anisha Ankush
ATRON Group LLC

Michael Baker

Vincent Barone
Panduit Corporation

Geza Batiz
Toro Co.

Cathy Becker
JC Manufacturing

James Blanche
NASA Marshall Space Flight Center

Gerald Bogert
Bechtel Plant Machinery, Inc.

Alvin Boutte
NASA Goddard Space Flight Center

Bud Bowen
Winchester Interconnect

Lance Brack
Raytheon Missile Systems

Thomas Cerle
Ball Aerospace & Technologies Corp.

Zhiyan Chen
Zhuzhou CRRC Times Electric Co., LTD.

Thomas Cleere

Robert Cooke
NASA Johnson Space Center

Stephen Cooke
Electrical Components International

Miguel Dominguez
Continental Temic SA de CV

Bill Downtain
Cirris Systems Corporation

Caroline Ihlinger
Collins Aerospace

Chris Fitzgerald
NASA Goddard Space Flight Center

Robert Fornefeld
STI Electronics, Inc.

Daniel Foster
Missile Defense Agency (MDA)

B.J. Franco
Honeywell Aerospace

Mahendra Gandhi
Northrop Grumman Space Systems

Matt Garrett
Microsemi

Constantino Gonzalez
ACME Training & Consulting

William Graver
NTS - Baltimore

Dave Harrell
Viasat Inc.

Eric Harenburg
Boeing Company

Rick Hawthorne
Technical Training Center

Gaston Hidalgo
Toyota Motor North America

David Hillman
Collins Aerospace

Shelley Holt
L3Harris Communications

Ife Hsu
Intel Corporation

Paula Jackson
Raytheon UK

Kathy Johnston

Lawrence Joy

Joseph Kane
BAE Systems

Sean Keating
Amphenol Ltd (UK)

Jason Keeping
Celestica International L.P.

Russell Kido
Practical Components Inc.

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Rebekah Kovarik
Lockheed Martin

Vijay Kumar
Lockheed Martin Missiles &
Fire Control

Leo Lambert
EPTAC Corporation

Theodore Laser
L3Harris Communications

Evan Levy

John Mastorides
Honeywell Aerospace

Garry McGuire
NASA Marshall Space Flight Center

Randy McNutt
Northrop Grumman
Aerospace Systems

Roger Miedico
Raytheon Company

Brett Miller
USA Harness, Inc.

George Millman
Raytheon Missile Systems

Fernando Moreno
Cesar-Scott, Inc.

Mark Northrup
Raytheon Missile Systems

Agnieszka Ozarowski
BAE Systems

Bob Potysman
ATRON Group LLC

Sue Powers-Hartman
Killdeer Mountain
Manufacturing, Inc.

Ray Prasad
Ray Prasad Consultancy Group

Erik Quam
Uson LP

Edward Rios
Motorola Solutions

Richard Rumas
Honeywell Canada

Tammy Sargent
Collins Aerospace

Martin Scionti
Raytheon Vision Systems

Darrell Sensing
BAE Systems

Jose Servin Olivares
Vitesco Technologies

Gilbert Shelby
Raytheon Systems Company

Kim Souva
Kearfott Corporation

Toshiyasu Takei
Japan Unix Co., Ltd.

Bob Teegarden
Honeywell International - Torrance

Stephen Tisdale
Tisdale Environmental
Consulting LLC

Jonathon Vermillion
Ball Aerospace &
Technologies Corp.

Daniel Versluis
HYTEK

Debie Vorwald
Collins Aerospace

Debbie Wade
Advanced Rework Technology

Schuyler Williams
Lockheed Martin Missiles &
Fire Control

Alan Young
Jet Propulsion Laboratory

Style Yuan
Winchester Electronics
(Huizhou) Co., Ltd.

Jack Zhu
Veoneer China CO., LTD

Yaakov Zissman
Elta Systems Ltd.

Paul Zutter
U.S. Army Aviation &
Missile Command

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Design and Critical Process Requirements for Cable and Wiring Harnesses

1 GENERAL

1.1 Scope This document provides design and critical process requirements and technical insight that have been removed from the acceptance standards for cable and wire harness assemblies. 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.

1.2 Purpose This document is the cable and wiring harness and systems-level design requirements companion to IPC/WHMA-A-620 and its associated space addendum.

The intent of this document is to set forth the general design requirements for electrical wiring harnesses and cable assemblies. This document is intended for use by the design engineer, manufacturing engineer, quality engineer, or other individual responsible for the tailoring of specific requirements of this document to the applicable performance class.

a. In-Service Criteria. This document defines design requirements criteria to meet the expected performance and reliability for the expected product service life. It is not the intent of this document to establish or define "In Service" design requirements or acceptance criteria to address performance or reliability issues caused by aging or use. However, the criteria and limits that are currently detailed in this document may be considered to be wide enough to be applicable to the more common hardware degradation conditions caused by aging / use. Use of these criteria for "In Service" hardware conditions should be AABUS.

b. Alternate / Contractor-Proprietary Documents or Processes. It is not the intent of this document to exclude any alternate or contractor-proprietary documents or processes that meet or exceed the baseline of requirements established by this document. Use of alternate or contractor-proprietary documents or processes **shall [A1A2A3]** require review and prior approval of the User.

c. 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 (i.e., 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) and/or materials (e.g., solder, flux, cleaning agents).
- The Manufacturer is considered the entity that provides a service or product to the User.

1.3 Performance / Product Classification This document recognizes that electrical wiring harnesses and cable assemblies are subject to performance / product classifications by intended end-item use. Three general end-product classes have been established to reflect differences in producibility, complexity, functional performance requirements, and verification (inspection/test) frequency. It should be recognized that there may be requirement overlaps between classes,

The User is responsible for defining the performance class required, whether compliance to any of the A through C Appendices is required, and to indicate any exceptions to specific parameters where appropriate.

Class 1 – General Electronic Products
Includes products suitable for applications where the major requirement is function of the completed assembly.

Class 2 – Dedicated Service Electronic Products
Includes products where continued performance and extended life is required, and for which uninterrupted service is desired but not critical. Typically, the end-use environment would not cause failures.

Class 3 – High Performance/Harsh Environment Electronic Products
Includes products where continued high performance or performance-on-demand is critical, equipment downtime cannot be tolerated, end-use environment may be uncommonly harsh, and the equipment must function when required, such as life support or other critical systems.