

2020 IEEE SA Standards Style Manual

STANDARDS

Introduction

The IEEE Standards Style Manual (PDF) establishes preferred style for the preparation and structure of proposed IEEE standards (drafts). It also cites requirements of the *IEEE SA Standards Board Operations Manual* that are related to the development and publication of IEEE standards.

The standards committee of an IEEE Standards project is responsible for providing the IEEE SA Standards Board with a complete, technically accurate draft of the standard, and this manual serves as a reference for working groups during the IEEE standards development lifecycle, particularly when drafting the standard.

IEEE SA also provides useful templates available in Adobe® FrameMaker® or Microsoft® Word.^{1, 2} The styles and format are built into the templates, which help reduce IEEE post-approval production time.

¹ Adobe and FrameMaker are registered trademarks of Adobe Systems Incorporated.

² Microsoft is a registered trademark of Microsoft Corporation in the United States and/or other countries.

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2020 IEEE SA Standards Style Manual

1. Overview

This manual establishes preferred style for the presentation and structure of proposed IEEE standards (drafts).

It is strongly recommended that working groups consult with IEEE SA content publishing staff before deviating from the style outlined in this manual. Failure to follow the recommendations of this manual may result in delayed approval of the draft standard by the IEEE SA Standards Board or in delayed publication.

This manual is not intended to be a guide to the procedural development of a standard.³ For that, consult the [IEEE SA Standards Board Bylaws](#) and the [IEEE SA Standards Board Operations Manual](#).⁴

2. Helpful resources

2.1 Training and online resources

Easy-to-use guidance on writing the draft is available on the IEEE SA website <https://standards.ieee.org/develop/drafting-standard/index.html>.

Those who are new to the IEEE SA standards development process, or who want to ensure that best practices are being followed, should consider enrolling in IEEE SA's free Working Group Chair Fundamentals course, available on the IEEE Learning Network

(<https://iln.ieee.org/public/TrainingCatalog.aspx>). Editorial information is covered in Module 9, "The Editorial Process" and Module 11, "Final Approval and Publication."

For additional information on SA's standards development training program, visit <https://standards.ieee.org/about/training/index.html>.

³While this manual uses the term "standard," its rules apply generically to guides and recommended practices as well.

⁴IEEE Standards manuals are available on the IEEE Standards website (<http://standards.ieee.org/develop/policies>). Users are encouraged to visit this site for the most up-to-date information.

2.2 Documents

The following documents are helpful resources for writing an IEEE Standards draft. Consult the most recent version of undated sources.

ANSI Y32.9, American National Standard Graphic Symbols for Electrical Wiring and Layout Diagrams Used in Architecture and Building Construction.⁵

ANSI/IEEE Std 260.3™, American National Standard for Mathematical Signs and Symbols for Use in Physical Sciences and Technology.

IEC 60050, IEC International Electrotechnical Vocabulary.⁶

IEC Multilingual Dictionary—Electricity, Electronics, and Telecommunications, 2005, Edition 6.⁷

IEEE SA Standards Board Bylaws, New York: Institute of Electrical and Electronics Engineers, Incorporated, 2019.

IEEE SA Standards Board Operations Manual, New York: Institute of Electrical and Electronics Engineers, Incorporated, 2019.

IEEE Standards Dictionary Online.⁸

IEEE Std 91™, IEEE Standard Graphic Symbols for Logic Functions.^{9, 10}

IEEE Std 260.1™, IEEE Standard Letter Symbols for Units of Measurement (SI Units, Customary Inch-Pound Units, and Certain Other Units).

IEEE Std 260.4™, IEEE Standard Letter Symbols and Abbreviations for Quantities Used in Acoustics.

IEEE Std 270™, IEEE Standard Definitions for Selected Quantities, Units, and Related Terms, with Special Attention to the International System (SI).

IEEE Std 315™, IEEE Standard Graphic Symbols for Electrical and Electronics Diagrams (Including Reference Designation Letters).

IEEE Std 945™, IEEE Recommended Practice for Preferred Metric Units for Use in Electrical and Electronics Science and Technology.

IEEE Std 991™, IEEE Standard for Logic Circuit Diagrams.

IEEE/ASTM SI 10, American National Standard for Metric Practice.

ISO/IEC Directives, Sixth Edition, 2011, Part 2, Rules for the structure and drafting of International Standards.

⁵This publication, and other ANSI standards appearing in this clause, are available from The Institute of Electrical and Electronics Engineers, 445 Hoes Lane, Piscataway, NJ 08854, USA (<http://standards.ieee.org/>).

⁶IEC publications are available from the International Electrotechnical Commission (<http://www.iec.ch>) and the American National Standards Institute (<http://www.ansi.org/>).

⁷Available via the Internet at <http://www.electropedia.org>.

⁸The *IEEE Standards Dictionary Online* is available at: <http://dictionary.ieee.org>. An IEEE Account is required for access to the dictionary, and one can be created at no charge on the dictionary sign-in page.

⁹IEEE publications are available from The Institute of Electrical and Electronics Engineers, 445 Hoes Lane, Piscataway, NJ 08854, USA (<http://standards.ieee.org/>).

¹⁰The IEEE standards or products referred to in this clause are trademarks of The Institute of Electrical and Electronics Engineers, Incorporated.

ISO/IEC Guide 21: 2005, Regional or national adoption of International Standards and other International Deliverables.

Merriam-Webster's New Collegiate Dictionary. Springfield, MA: Merriam-Webster, Incorporated.

The Chicago Manual of Style. Chicago: The University of Chicago Press.

3. Using IEEE SA templates to write the draft

IEEE drafts should be developed using IEEE SA templates, currently available in Adobe® FrameMaker® and Microsoft® Word.^{11, 12} IEEE SA templates and supporting documentation are available from the [IEEE Standards website](http://www.ieee.org/standards). Questions about using IEEE SA templates can be sent to sa_templates@ieee.org.

In addition to expediting document creation, the MS Word template easily enables line numbering. If used, line numbers should appear in the margins of the first page and should appear in the margins of each subsequent page. If using a software program other than MS Word or Adobe FrameMaker, please contact IEEE SA content publishing staff as early as possible in the development process.

4. Responsibilities of the standards committee

For information on IEEE standards draft requirements, please refer to the *IEEE SA Standards Board Operations Manual*. The general responsibilities and duties of the standards committee of each project are delineated in [5.1.1](#) and [5.1.2](#) of the *IEEE SA Standards Board Operations Manual*.

If there is a conflict between the *IEEE SA Standards Board Operations Manual* and this manual, the *IEEE SA Standards Board Operations Manual* takes precedence.

5. Copyright and permissions

5.1 General copyright policy

Contributions by standards participants to IEEE standards projects are subject to the IEEE SA copyright policy found in Clause [7](#) of the *IEEE SA Standards Board Bylaws* and [6.1](#) of the *IEEE SA Standards Board Operations Manual*.

Go to <http://standards.ieee.org/ipr/copyright.html> for additional information and FAQs on IEEE SA copyright policy.

5.2 Excerpting material published by other organizations

Any participant who submits contributions from previously published sources shall comply with [7.2.1](#) of the *IEEE SA Standards Board Bylaws*.

Standards developers are encouraged to request permission from copyright owners as soon as the decision is made to include copyrighted material in a draft. Standards developers should initiate the permission-seeking process prior to the IEEE SA ballot. Permission letters shall be submitted to IEEE SA staff, along with the draft, as part of Mandatory Editorial Coordination (MEC) review. If the copyright material is

¹¹ Adobe and FrameMaker are registered trademarks of Adobe Systems Incorporated.

¹² Microsoft is a registered trademark of Microsoft Corporation in the United States and/or other countries.

added to the draft during the IEEE SA ballot, receipt of permission letters shall be required before the draft can be recirculated to the IEEE SA ballot group.

Note that permission letters will be reviewed by IEEE SA staff at the time they are submitted for MEC review and again when the draft is submitted to the IEEE SA Standards Board for approval. If there are difficulties with obtaining permission responses, the working group should consider citing the information normatively rather than including an excerpt.

It is preferred that the IEEE permission form letters are used when seeking permission (see <https://standards.ieee.org/ipr/index.html>). IEEE requests the following:

[N]on-exclusive, irrevocable, royalty-free permission to use this material is granted to IEEE for world rights distribution, with permission to modify and reprint in all future revisions and editions of the resulting draft and approved IEEE standard, and in derivative works based on the standard, in all media known or hereinafter known.

In addition, no limitations on the right of IEEE to determine appropriate business arrangements for its standards shall be included as a stipulation for use of material. Contact the IEEE SA at stds-copyright@ieee.org, with any questions regarding material that might not meet the requirement.

The following credit line shall be used if specific language from the copyright holder is not available:

<Material> reprinted with permission from <copyright owner>, <title of work from which material is excerpted>, © <copyright year>.

The standards committee is responsible for alerting the IEEE SA, stds-copyright@ieee.org, in instances where legal agreements or licenses are required. This includes the adoption of independently developed documents as potential IEEE standards. Working groups shall not negotiate agreements with outside entities with regard to IEEE standards. Please contact the IEEE SA, stds-copyright@ieee.org, with any questions about licensing agreements, copyright, and permission.

6. Patents

Working groups concerned about or interested in the relationship of patents and patent-related requirements to IEEE standards should review the IEEE SA Standards Board [Patent Committee website](#). Please note that any reference to patents or patent applications shall be made only in the frontmatter of the standard. The [IEEE SA templates](#) contain the patent statement that is to be included in the frontmatter.

7. Trademarks

Working groups shall research the proper usage guidelines for any trademarks appropriate for their drafts and ensure that no fees are required, limitations imposed, etc. This information is usually stated on the websites of the trademark owners. If used, any trademarked items shall be identified in the standard and marked as such (with either ® or ™), as appropriate, upon first reference. All trademarked items cited in standards shall be credited to the trademark owner in the frontmatter of the standard. Note that there are restrictions on trademark use. See Clause 8.

IEEE designations are trademarks of the IEEE and shall be identified as trademarks (® or ™, as appropriate) at first citation of each designation in the frontmatter and in the body of the draft.

8. Commercial terms and conditions

The IEEE SA policy on commercial terms and conditions is set forth in [6.2](#) of the *IEEE SA Standards Board Operations Manual*.

Citation of a product, service, or company shall be avoided. In those cases, where a sole source exists, the product, service, or company shall be described generically in text and the product, service or company supplied in a footnote accompanying the text, as follows:

At the time of this publication [product, service, or company] was an example of [name of generic product, etc.]. This information is given for the convenience of users of this standard and does not constitute an endorsement by the IEEE of these products. Equivalent products may be used if they can be shown to lead to the same results.

If every effort has been made to substitute a generic word or phrase in text for the product, service, or company, but no suitable substitute can be found, add the following footnote to accompany the citation:

This information is given for the convenience of users of this standard and does not constitute an endorsement by the IEEE of these products. Equivalent products may be used if they can be shown to lead to the same results.

In addition to the above footnote, within the text add “or the equivalent” after the name of the product, service or company. For example,

“...use an ABC, or the equivalent, to monitor...”

9. Standard language i.e., shall, should, may, and can

Mandatory requirements set within an IEEE standard are clearly distinguished by using specific standard verbs—specifically, shall, should, may, and can.

Shall, should, may, and can are defined in [6.4.7](#) of the *IEEE SA Standards Board Operations Manual*.

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (*shall* equals *is required to*).

Note that the use of the word *must* is deprecated and shall not be used when stating mandatory requirements; *must* is used only to describe unavoidable situations. The use of the word *will* is deprecated and shall not be used when stating mandatory requirements; *will* is only used in statements of fact.

The word *should* indicates that among several possibilities, one is recommended as particularly suitable without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (*should* equals *is recommended that*).

The word *may* is used to indicate a course of action permissible within the limits of the standard (*may* equals *is permitted to*).

The word *can* is used for statements of possibility and capability, whether material, physical, or causal (*can* equals *is able to*).

10. Additional guidance regarding language use in IEEE standards

10.1.1 Homogeneity

Uniformity of structure, style, and terminology should be maintained not only within each standard, but also within a series of associated standards. The structure of associated standards and the numbering of their clauses should be identical, as far as possible. Analogous wording should be used to express analogous provisions; identical wording should be used to express identical provisions.

The same term should be used throughout each standard or series of standards to designate a given concept. The use of an alternative term (synonym) for a concept already defined should be avoided. As far as possible, only one meaning should be attributed to each term used.

10.1.2 That and which

The words *that* and *which* are commonly misused; they are not interchangeable. *That* is best reserved in essential (or restrictive) clauses; *which* is appropriate in nonessential (or nonrestrictive) parenthetical clauses. Simply stated, if a comma can be inserted before the word *that* or *which*, the word should be *which*. If a comma would not be used, the word to use is *that*.

Example:

- a) Defining the inputs and outputs provides a better understanding of the steps *that* are necessary to complete the process.
- b) Defining the inputs and outputs provides a better understanding of these steps, *which* are explained later in this standard.

10.1.3 Language and terminology

IEEE SA uses language and terminology that is in compliance with the IEEE Nondiscrimination Policy <<https://www.ieee.org/about/corporate/governance/p9-26.html>>.

The IEEE SA also uses generic titles (e.g., *chair* rather than *chairman*) in the standard. The following practices shall apply:

- a) When writing in the third person, the phrase *he, she, or they* should be used. The male, female, or they pronoun alone or the variation *he/she/they* should not be used.
- b) If a particular sentence becomes cumbersome when *he, she, or they* are used, the sentence should be rewritten in the plural or completely rewritten to avoid using pronouns. The indefinite pronoun *one* should be avoided. In references to a company, the pronoun *it*, not *we* or *they*, should be used.

10.1.4 “Absolute” verbiage

Avoid making guarantees if there is a possibility of unforeseen situations or circumstances altering an outcome. Review the text for any explicit or implicit guarantees made within the document, especially those that are safety-related.

For example, words such as “ensure,” “guarantee,” “always,” “maximize,” “minimize,” etc., should be modified if they are inaccurate. Substitutions might include “often,” “reduce,” or “improve.” For example, “to ensure safety” might be changed to “to improve safety” or “to prevent” might be changed to “to reduce.”

When applicable suggest “verify” or “assist in ensuring.”

10.1.5 Use of the terms *safe* or *safety*

Avoid the use of the word *safe* in a standard unless the condition or practice referenced by the word *safe* has been tested under all cases as being, in fact, safe. Typically, this is not the case. Thus, unless it can be demonstrated that such condition or practice is safe, *safe* should not be used. Words such as *safer* or *safest* can be used in a relative context if it can be demonstrated to be the case. For example, it is proper to say that one set of conditions or practices is safer than another, if in fact true, or that it is safer to employ a certain practice than not in a given situation. However, the term *safest* implies an absolute condition, which, in certain contexts, has the same implication as *safe* and, thus, should not be used. For example, *this is the safest set of conditions for using waveguide* is an improper usage.

The word *safety* should be avoided if it is being used to address a set of conditions or practices that have not been established for the purpose of promoting safety under all situations in which such conditions or practices will be employed. For example, the *following 10 safety considerations should be reviewed before implementing this practice* should not be used.

10.1.6 Use of the first- or second-person forms of address

The first-person form of address (*I, we*) or the second-person form of address (*you*) should not be used or implied in standards, e.g., “*You should avoid working on lines from which a shock or slip will tend to bring your body toward exposed wires.*” This sentence should be rewritten to identify the addressee, as follows: “*Employees should avoid working on lines from which a shock or slip will tend to bring their bodies toward exposed wires.*”

11. Frontmatter of an IEEE draft standard

11.1 General

The frontmatter of an IEEE standard is informative, meaning it is not officially part of the standard. Drafts should contain a frontmatter and main text, and follow the style outlined in this manual. The frontmatter and body of the draft are paginated with Arabic numerals, e.g., 1, 2, 3, etc. Frontmatter elements *required* in the draft prior to going to ballot are as follows:

- Designation (see 11.2.1)
- Title of the standard
- Introduction
- Draft copyright statements

A statement titled, “Important Notices and Disclaimers Concerning IEEE Standards Documents” (liability, translations, official statements, comments on standards, laws and regulations, copyrights, photocopies, updating of IEEE Standards documents, errata, and patents) is also required. These are included in the [IEEE SA templates](#) or can be obtained by contacting the IEEE SA content publishing staff. ***These shall not be altered.*** See Annex B for an example.

11.2 Required frontmatter elements

11.2.1 Draft labeling and designations

All drafts shall be clearly labeled to reflect their status as unapproved. The title of the document shall start with the word *Draft*. The term *IEEE* shall not be used in a title until a standard is approved by the IEEE SA Standards Board. The draft designation and the date of the draft shall appear in the upper right corner of each page of the draft. The designation and date shall not be combined. See Annex B for examples of appropriate draft labeling.

The IEEE standards designation shall be structured as IEEE Pxxx/DXX, where xxx represents the specific designation and XX is a number that represents the specific draft version of that document. Draft versions shall be maintained, and are most important during a ballot; the draft number should be updated as least as often as the document is modified and/or recirculated.

Go to <https://development.standards.ieee.org/myproject/Public/mytools/init/parnum.pdf> for information on obtaining a designation.

11.2.2 Draft copyright statements

All IEEE drafts are obligated to carry statements of copyright. The following information shall appear on the first page of every IEEE Standards draft (please note that <20XX> shall be replaced with the current year of distribution):

Copyright © 20XX by The Institute of Electrical and Electronics Engineers, Incorporated
Three Park Avenue
New York, New York 10016-5997, USA
All rights reserved.

This document is an unapproved draft of a proposed IEEE Standard. As such, this document is subject to change. USE AT YOUR OWN RISK! IEEE copyright statements SHALL NOT BE REMOVED from draft or approved IEEE standards, or modified in any way. Because this is an unapproved draft, this document must not be utilized for any conformance/compliance purposes. Permission is hereby granted for officers from each IEEE Standards Working Group or Committee to reproduce the draft document developed by that Working Group for purposes of international standardization consideration. IEEE Standards Department must be informed of the submission for consideration prior to any reproduction for international standardization consideration (stds-copyrights@ieee.org). Prior to adoption of this document, in whole or in part, by another standards development organization, permission must first be obtained from the IEEE Standards Department (stds-copyrights@ieee.org). When requesting permission, IEEE Standards Department will require a copy of the standard development organization's document highlighting the use of IEEE content. Other entities seeking permission to reproduce this document, in whole or in part, must also obtain permission from the IEEE Standards Department.

IEEE Standards Department
445 Hoes Lane
Piscataway, NJ 08854, USA

The following information shall appear on every page of the draft, at the bottom of the page:

Copyright © <20XX> IEEE. All rights reserved.
This is an unapproved IEEE Standards Draft, subject to change.

11.2.3 Open Source draft statement

All Open Source and documentation developed by a Standards Committee or Working Group that has not been approved by the IEEE SASB shall include the following disclaimer:

Disclaimer

This Open Source repository/documentation contains material that may be included in, or referenced by, an unapproved draft of a proposed IEEE Standard. All material in this repository/documentation is subject to change. The material in this repository/documentation is presented “as is” and with all faults. Use of the material is at the sole risk of the user. IEEE specifically disclaims all warranties and representations with respect to all material contained in this repository/documentation and shall not be liable, under any theory, for any use of the material. Unapproved drafts of proposed IEEE standards shall not be utilized for any conformance/compliance purposes.

11.3 Title

Per [4.2.3.2](#) of the *IEEE SA Standards Board Operations Manual*, the title on the draft document shall be within the scope as stated on the most recently approved PAR.

All titles of IEEE drafts shall start with the word *Draft*, followed by

- “Standards [for]” when the standard specifies mandatory requirements.
- “Recommended Practice [for]” when the standard provides recommendations.
- “Guide [for]” when the standard furnishes information.
- “Trial-Use (Standard, Recommended Practice, or Guide) [for]” for when the document will be published for a limited period of time.

The initial letter of each word in the title (except prepositions) should be capitalized.

“IEEE” shall not be placed at the beginning of the title.

Example:

Draft Standard for the Application and Testing of...

When an IEEE standard covers a limited range of quantities, such as voltage, current, power, and size, the numerical limits of the ranges covered shall be included in the title, scope, or purpose, wherever it first appears. The use of non-quantitative terms (such as high and low, large and small, wide and narrow) should be avoided. Abbreviations should be avoided in titles of standards, except in the case of units of measurement (kV, mm, etc.). However, if such use is warranted, the policy stated in 12.5 shall be followed.

11.4 Abstract and keywords

The inclusion of an abstract and keywords in IEEE standards allows the documents to be referenced in a wide range of bibliographic environments, thereby increasing their utility, visibility, and availability to the public. An abstract and keywords shall be included immediately following the title page of each standard. Abstracts should be based on the scope and purpose of the standard as indicated on the PAR. Abstracts should be no longer than 15 lines, and should be written in the passive voice. Keywords should highlight key terms and phrases from the text of the draft standard, and should specify the designation number of the project.

11.5 Participant lists

At a minimum, a roster of the officers and members of the working group that developed the document shall be provided by the working group. Individuals or entities that also contributed to the preparation of the document may be included in addition to the working group list (permission from entities shall be received prior to including the names in the draft).

In the working group roster, full first names are preferred over initials. Titles (Dr., Ms., P.E.) shall not be included with proper names.

The list of voting members of the balloting group is added by IEEE SA content publishing staff during the publication process. Only the balloters (individuals or entities) who vote (approval, disapproval, or abstention) are listed in the standard. The following paragraph shall be placed in the frontmatter of all IEEE drafts, above the list of voting members of the balloting group, and shall reflect the type of ballot that was conducted (individual or entity):

The following members of the <individual/entity> balloting committee voted on this standard. Balloters may have voted for approval, disapproval, or abstention.

More information regarding the Standards Board and its members can be found at:

<https://standards.ieee.org/content/ieee-standards/en/about/sasb/index.html>.

11.6 Introduction

An introduction should give the history of the standard, a description of its purpose, and, if the standard is a revision, an explanation of the principal changes from the previous edition. The introduction should also explain the document structure for multipart standards or for documents within a family of standards. An introduction is not an official or normative part of the proposed standard and shall not contain requirements or recommendations; therefore, the following statement shall appear in a box above the text:

This introduction is not part of IEEE Pxxx, title of draft.

11.7 Permissions list

Permissions shall be obtained for all material reprinted or excerpted from other sources. The list of permissions should appear in the standard, under a flush left header titled, “Acknowledgments,” in the following format. This segment should appear after the introduction.

Acknowledgments

Permissions have been granted as follows:

Portions of this standard reprinted with permission from Avaya, IETF RFC 2108 Definitions of Managed Objects for IEEE 802.3 Repeater Devices using SMIV2, © 1997.

Portions of this standard reprinted with permission from Microsemi Corporation, IETF RFC 3621 Definitions Power Ethernet MIB, © 2003.

Portions of this standard reprinted with permission from Avaya, IETF RFC 3621 Definitions Power Ethernet MIB, © 2003.

Portions of this standard reprinted with permission from the Hewlett-Packard Company, IETF RFC 3635 Definitions of Managed Objects for the Ethernet-like Interface Types, © 2003.

NOTE—Requests for special acknowledgments that do not include permissions shall be directed to the IEEE SA content publishing staff.

11.8 Table of contents

A table of contents listing the main clauses (identified by one digit) and the first series of subclauses under each clause (identified by two digits) should be supplied. The next series of subclauses (identified by three digits) may be included when deemed appropriate by the IEEE SA content publishing staff and the working group. The table of contents should be generated automatically and should be frequently updated as the draft evolves. Lists of tables and figures are normally not included in the table of contents, although particularly lengthy documents might warrant their inclusion. Only the appropriate clauses, subclauses, and normative and/or informative annexes should be listed. See the example of a draft standard in Annex B.

12. Body of an IEEE draft standard

12.1 Normative and informative clauses

[IEEE standard document structure \(6.4\)](#) of the *IEEE SA Standards Board Operations Manual* defines which parts of a standard are normative and which parts of a standard are informative.

Normative text is information that is required to implement the standard, and is therefore necessary to determine conformance with the standard. Informative text is provided for information only, and is therefore not necessary to determine conformance with the standard. Both normative and informative text are provided for review and commenting during the IEEE Standards Association ballot.

Normative text (information *required* to implement the standard) includes the following:

- The main clauses of the documents including figures, tables, and equations
- Footnotes to tables
- Footnotes to figures
- Annexes marked “(normative)”

Informative text (text provided for information only) includes the following:

- Frontmatter
- Notes to text, tables, and figures

At the first instance of a note associated with text, a table, or a figure, the following footnote should appear:

Notes to text, tables, and figures are for information only and do not contain requirements needed to implement the standard.

- Annexes marked “(informative),” e.g., Bibliography

Interspersed normative and informative text is not allowed. As such, neither clauses nor subclauses shall be labeled as informative. Contact IEEE SA content publishing staff early in the process if there are questions as to whether material in the draft should be labeled as normative or informative.

12.2 Order of clauses

12.2.1 General

The first clause of a standard, Clause 1, shall always be an overview (except for amendments and corrigenda, which do not usually have an overview, scope, or purpose). If the standard contains normative references and definitions, they shall be Clause 2 and Clause 3, respectively. The clauses that follow Clause 3 can be ordered in any way by the working group. If clause and subclause titles begin with numbers, they should be spelled out, unless unavoidable (e.g., 10BASE-T).

12.2.2 The overview of the draft

The overview includes the scope of the standard that shall be within the scope of that given on the PAR. The overview shall also include a subclause for word usage (see 12.2.5). Therefore, at a minimum, the overview will contain two subclauses—one for the scope and the other for word usage. The overview may include optional topics such as a purpose, applications, and other areas that the working group considers relevant. These optional topics should be presented as separate subclauses of the overview; they should not be lumped in with the scope or word usage.

The overview shall not contain detailed discussions of the general technical content of the standard nor shall it list the contents of the standard (since this is the purpose of the table of contents). If the standard contains annexes, the application of these annexes should be described in the overview.

12.2.3 Scope

The scope of the standard shall explain in statements of fact what is covered in the standard and, if necessary, what is not covered in the standard—in other words, the technical boundaries of the document. The scope should be succinct so that it can be abstracted for bibliographic purposes.

For new and revision projects, the scope of the draft shall be within the scope of that given on the PAR, as determined by the balloting group voting on the draft.

For amendments and corrigenda, there is normally no scope in the draft. Therefore, on the PAR, the scope shall state what the amendment/corrigendum is changing.

For standards projects that incorporate Open Source, the fact that the standard incorporates Open Source and the location of that Open Source, via the URL or hyperlink, should be included in the Scope

Regardless of project type, the scope of the draft has to be within the scope of the project given on the PAR form.

Please note the distinction of the scope from the purpose of the standard discussed in 12.2.4.

12.2.4 Purpose

A paragraph describing the purpose of the standard is not mandatory in the draft. However, if included, the purpose of the standard and its intended application shall be included in a separate subclause (1.2). The purpose shall explain why the standards project is needed.

For new and revision projects, the purpose (if included) of the draft shall be within the parameters of the purpose given on the PAR, as determined by the balloting group voting on the draft.

For amendments and corrigenda, there is normally no purpose in the draft standard. Therefore, on the PAR form, the purpose shall state why the changes are being made.

Please note the distinction of the purpose from the scope of the standard discussed in 12.2.3.

12.2.5 Word usage

Include the definitions of “*shall*,” “*should*,” and “*may*” within a draft standard. The subclause appears in Clause 1 Overview of the draft. See 12.2.2 and the example of a draft standard in Annex B for more information.

12.3 Normative references

12.3.1 What is a normative reference?

In an IEEE standard normative references are those documents that contain material that must be understood and used to implement the standard.¹³ Thus, normative references are indispensable when applying the standard. The decision to include something as a normative reference in a standard should be made thoughtfully. Documents to which reference is made only for information or background, and documents that served merely as references in the preparation of the standard, are not normative references. Such documents may, however, be included in a bibliography. (See Clause 19.)

Normative references may include the following:

- a) **Standards:** IEEE standards and standards developed by other recognized standards developing organizations (SDOs) are the preferred source of normative references.
- b) **Non-standards documents:** A document that is not a standard may be cited provided that:
 - It is judged by the balloting group to have wide acceptance and authoritative status.
 - It is publicly available at reasonable cost.
 - The reference includes the edition or date of publication

Be aware that non-standards documents may prove problematic because they might be revised without notice in a manner that might adversely affect the standard in which it is normatively referenced.

- c) **Draft standards:** Unpublished drafts may be used as normative references as long as they are:
 - Dated
 - Readily available
 - Retrievable

¹³ If the standard is intended for adoption by another organization, the working group should consider requirements for normative references by that organization. Contact IEEE SA content publishing staff for information about specific requirements.

A copy of ALL drafts shall be submitted to IEEE SA to be placed on file as an archive. Note that if a referenced IEEE draft is approved prior to publication of the document, the draft reference will be updated to reflect this change during the publication process. If the working groups prefers that the draft reference remain as is, the citation shall be followed by “(this version).”

- d) **Withdrawn standards:** Although they may be included in the Normative References, BE AWARE: withdrawn standards may contain obsolete or erroneous information and may be difficult to retrieve.
- e) **Open Source:** Normatively referenced Open Source shall be listed in the Normative Reference clause. Similar to other types of normative references, normative Open Source may be dated (to reference a specific version) or undated (to reference the most recent version). A decision to have an undated normative reference to Open Source shall be considered carefully by the Working Group. The Working Group is expected to review updates to undated normative references during the standards development process and after IEEE SA Standards Board approval to determine if they continue to align with the standard, and if not, to take appropriate action (e.g., if a dated reference should be noted in the standard instead, submit a PAR for a revision or amendment to the standard.). Open Source developed in the IEEE Open Source repository may be listed as an undated reference.

The normative reference to Open Source shall specify one or more source code libraries within a specified code repository in a specified project. A reference may specify one or more specific versions of each library, or “the most current version” in the instance of undated references. If the reference is undated, the version approved by the IEEE SA Standards Board approval shall be indicated on the repository, and a footnote shall be provided for access to the approved version.

12.3.2 Dated versus undated normative standards references

First, remember ALL drafts included in the Normative References shall be numbered and dated [see item c) in 12.3.1]. Similarly, ALL non-standards references shall be dated [see item b) in 12.3.1].

When referencing standards, dated and/or undated references are allowed. Make this decision thoughtfully. Using undated references helps eliminate the burden of continuous updates to align standards as they are revised, while ensuring that the most up-to-date information on technologies and statutes is referenced (when appropriate). Dated references can be used in certain circumstances, such as when a high degree of specificity is needed. Note that in-text reference to a specific clause, subclause, table, or figure of another document shall be dated even if the undated version of the document is listed in the normative references. Ultimately, the responsibility of determining whether a reference should be dated or undated lies with the working and balloting groups, who shall determine what is best during implementation of a given standard, and therefore what is best for the standard’s users.

12.3.3 Citing a normative reference in text

As described in [6.4](#) of the *IEEE SA Standards Board Operations Manual*, each normative reference shall be cited in normative text and the role and relationship of each referenced document shall be explained in the body of the standard.

If a reference is not specifically cited in the normative text of the document, then it shall not be listed in the normative references clause. In such cases, it shall be listed in the first or final informative annex, titled Bibliography.

Examples of properly constructed in text citations of a normative reference are as follows:

Dedicated battery systems for control power, starting, and field flashing shall be sized per IEEE Std 485™, or IEEE Std 1115™, and according to postulated number of starts over an extended duration without capability to recharge.

Where the clamping component is used in signal circuits, it is important to know the capacitive loading and its variation with voltage. The capacitance values should be measured at zero voltage bias and at 80% of the minimum limiting voltage threshold (see 5.7 of IEEE Std C62.42.3-2017).

12.3.4 Structure of the normative references clause

The following guidelines shall be followed when structuring the normative references clause:

- a) The normative references clause is introduced with the following paragraph:

“The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.”
- b) IEEE SA content publishing staff will list the information (i.e., title) for the most current edition of the undated material cited. In some cases, the most current edition is not the one required. It is also important for the working group to remember that the dated edition listed in the balloted document will be the one that appears in the published document. Therefore, it is the responsibility of the standards committee to determine not only which edition of a document is applicable in each case, but also to ensure that the balloted document lists the correct edition.
- c) The working group shall endeavor to supply complete and current information for normative references. Note that IEEE SA content publishing staff cannot verify that normative references to updated editions of documents (i.e., undated references) are accurate; therefore, it is up to the standards committee to consult the latest editions to see if they still apply.

12.3.5 Style for standards reference entries

Normative references shall be listed in alphanumeric order by designation, including the full title. Documents that are not standards shall include the edition or date of publication in the citation. A footnote should be inserted in the text after the first cited normative reference in order to tell the reader where the references can be obtained.

For an example of a properly formatted normative references clause, see the example of a draft standard in Annex B.

References should be cited by designation (e.g., IEEE Std 1226.6™ or IEEE Std 1625™-2004) in the text, in tables, in figures, or in notes at the point where the reference applies. Note that IEEE designations shall be identified as trademarks (® or ™, as appropriate) at first citation of each designation in the frontmatter and in the body of the draft.

12.3.6 Style for non-standards citations

Refer to *The Chicago Manual of Style* for rules on citing sources other than standards.

For citing Internet sources, the following format should be used where <entity> is replaced with the name of the organization and <URL> is replaced by the Internet location:

“... is available from the <entity> Website <URL>.”

“(see the information at the following Internet location: <URL>).”

The URL should be the most stable location to avoid inadvertent or intentional changes that would affect the site name, i.e., use the index to the page rather than the page itself.

The working group shall obtain permission where needed. The IEEE SA should be contacted at stds-copyright@ieee.org, in instances where legal agreements are required (see Clause 5).

If a document listed in the bibliography or normative references is accessed from the Internet, the document title, date, version, and other pertinent information should be listed, followed by a footnote that gives the Internet location. If the document needs to be on the IEEE Standards website, the working group can insert the following placeholder until the site location is assigned:

“This document is available from the IEEE Standards Website <insert IEEE Internet location>.”

Contact IEEE SA content publishing staff with any questions about documents that should be placed on the IEEE Standards website.

12.3.7 Style for Open Source

Open Source developed in the IEEE Open Source repository may be listed as a dated or undated reference as follows:

Dated references

General template:

Company or Creator Last Name, Creator First Name. Year published. Title of Software in Title Case, version number. Place of Publication. Accessed full date. DOI or URL.

Example using DOI: *Brian McFee, Matt McVicar, Stefan Balke, Carl Thomé, Vincent Lostanlen, Colin Raffel, Dana Lee, et al. 2018. “Librosa/librosa: 0.6.2”. Zenodo. doi:10.5281/zenodo.1342708.*

Example using URL: *Brian McFee, Matt McVicar, Stefan Balke, Carl Thomé, Vincent Lostanlen, Colin Raffel, Dana Lee, et al. 2018. “Librosa/librosa: 0.6.2”. <https://github.com/librosa/librosa/archive/0.6.2.zip> (supplement to <https://github.com/librosa/librosa/tree/0.6.2>)¹⁴*

Undated (unversioned) reference

General template:

Company or Creator Last Name, Creator First Name. Year published. Title of Software in Title Case. Place of Publication. Accessed full date. URL.

Example using URL: *Brian McFee, Matt McVicar, Stefan Balke, Carl Thomé, Vincent Lostanlen, Colin Raffel, Dana Lee, et al. 2018. “Librosa/librosa”. <https://github.com/librosa/librosa/archive/master.zip> (supplement to <https://github.com/librosa/librosa/tree/master>)¹⁵*

¹⁴ Please note that “supplement to” indicates download archive link “<https://github.com/librosa/librosa/archive/0.6.2.zip>” is a supplement (e.g., downloadable file version) to the URL <https://github.com/librosa/librosa/archive/0.6.2.zip>

¹⁵ The “tree/master” refers to the branch of the repository. In general, this should be a link to the latest version being recommended for use and/or development, regardless of whether the branch name is “master” or some other name.

12.4 Definitions

12.4.1 Definitions and best practices

For the creation and maintenance of IEEE Standards terms and definitions, see Annex A.

12.4.2 General terminology usage

English words should be used in accordance with their definitions in the latest edition of *Merriam-Webster's New Collegiate Dictionary*. Electrical and electronics terms not defined in *Merriam-Webster's New Collegiate Dictionary* should be used in accordance with their definitions in the [Dictionary Online](#). The Dictionary is a continually-updated electronic version of the former IEEE 100, *The Authoritative Dictionary of IEEE Standards Terms*. Working groups are strongly encouraged to use definitions that already exist instead of creating new definitions or slightly modifying existing definitions. During MEC and during IEEE SA ballot, working groups may be asked to validate the use and presentation of terms. For assistance, IEEE draft developers may also find useful the *IEC Multilingual Dictionary of Electricity, Electronics, and Telecommunications* and the *IEC International Electrotechnical Vocabulary (IEV)*.

12.4.3 Construction of the definitions clause

A definitions clause is typically Clause 3 (unless the standard does not contain normative references, in which case the definitions clause would be Clause 2). Definitions should appear in alphabetical order, and the term defined should be written out completely and should not be inverted (e.g., “*drift rate*” rather than “*rate, drift*”). Each definition should be a brief, self-contained description of the term in question and shall not contain any other information, such as requirements or elaborative text. The term should not be used in its own definition.

All terms defined in IEEE standards are incorporated into the IEEE SA Standards Definitions Database. For this reason, it is important that terms and definitions have as general an application as possible. Definitions should not include references to other parts of the standard. An informative note may be provided to refer the user to another part of the standard. Terms defined in other standards may be used in IEEE standards as long as they are properly cited and the proper permission release form is received. After the definition, the source shall be cited in parentheses. It is the working group chair's responsibility to obtain the appropriate permissions if a standard uses a term from another source (see 5.2).

The definition should follow the defined term as a sentence preceded by a colon. Subdefinitions of a term should be marked as **(A)**, **(B)**, etc. Cross-references should occur after the definition and may consist of the following classes, in the order shown: *Contrast:*, *Syn:*, *See:*, and *See also:*. *Contrast:* refers to a term with an opposite or substantially different meaning. *Syn:* refers to a synonymous term. *See:* refers to a term where the desired definition can be found. *See also:* refers to a related term. The cross-references listed under these headings should be in alphabetical order, in bold type, and separated by semicolons when there are more than one. Abbreviations/acronyms should be spelled out at first use.

See Annex A for Guidelines and best practices for the creation and maintenance of IEEE standards terms and definitions.

Next is an example of a correctly styled definitions clause.