2022

AHRI Standards Style Guide

Approved by the AHRI Standards Committee, February 2022

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This AHRI Standards Committee Style Guide document is owned and maintained by the AHRI Standards Committee, a standing committee of the AHRI Board of Directors, and defines the policies and procedures related to development and approval of AHRI standards and guidelines.

Copies of this document shall be provided freely to interested parties.

Figures and examples in this document, unless otherwise noted, are informative.

Note:

This style guide supersedes *Appendix A* of the *2018 Standards Policy Committee Policy and Procedure*.

Intent

This style guide is intended for the guidance of the AHRI committees and staff in the development of standards and guidelines.

Review and Amendment

This style guide is subject to review and amendment.

2022 Edition

This edition of AHRI Standards Style Guide was prepared by the Ad Hoc Standards Style Guide Committee. It was approved by the Standards Committee on 18 February 2022.

Origin and Development of the AHRI Standards Style Guide

In 2021 the Standards Committee approved the *AHRI Policy & Procedures for the Development of Standards*. This separates the style guide from the policy and procedure document and requires style updates to align with the new version.

Summary of Changes

The AHRI Standards Style Guide contains the following changes, additions, and updates to *Appendix A* of the *2018 Standards Policy Committee Policy and Procedure*:

- Provides objectives of standards and style guide.
- Provides definitions of document conditions and elements.
- Provides clarification on required, conditional, and optional structural elements.
- Improves standard and guideline documentation of history and transparency with new Front Matter information requirements.
- Updates document structure in Purpose, Scope, and Definitions sections.
- Aligns editorial style with *Chicago Manual of Style 18th Edition* including lists, capitalization, unit spacing rules, punctuation, fractions, citations in reference lists, and citing websites and webpages.
- Defines and provides guidance for use of expressions of provisions that aligns with ISO/IEC.
- Provides guidance for vague words and phrases that aligns with ASHRAE rules.
- Updates rules for formatting tables to improve consistency across standards.
- Clarifies formatting rules for addenda and errata.
- Provides new formatting rules for interpretations and withdrawn documents.
- Provides rules for copyright and permissions.
- Updates rules for units of measure in standards and guidelines.

Committee Personnel

AHRI Ad Hoc Standards Style Guide Committee	
Participant	**Role**
Karl Best AHRI	Senior Manager, Standards
Kristin Carlson AHRI	Project Manager, Industry Sector Services
Henry Ernst Daikin Applied	AHRI Member
Diane Jacobs Rheem Manufacturing	AHRI Member
Patrick Marks Johnson Controls	AHRI Member
Karl Peterman Swegon	AHRI Member
Antonio Romeo AHRI	Associate Program Engineer, Industry Sector Services
Justin Sikorski AHRI	Manager, Standards
Rusty Tharp Goodman Manufacturing	AHRI Member
Jaime Yeh AHRI	Senior Program Engineers, Industry Sector Services
Adrienne Harding Project Associate, Standards	AHRI Staff Liaison

AHRI Standards Committee	
Participant	**Role**
Patrick Marks Johnson Controls	Chair
Henry Ernst Daikin Applied	Vice Chair
Bryan Ahee Bradford White	Primary
Diane Jakobs Rheem	Primary
Darcy Lee Trane	Primary
Bruce Perkins Lennox	Primary
Karl Peterman Swegon	Primary
Justin Prosser Danfoss	Primary
Rajan Rajendran Emerson	Primary

AHRI Standards Committee	
Participant	**Role**
Dominique Taudin Carrier	Primary
Jeremy Tidd Mitsubishi Electric	Primary
Karl Best Senior Manager, Standards	AHRI Staff Liaison

These lists represent the membership of the Standards Style Guide Committee at the time the Standards Committee approved final text of this edition. Since that time, changes in the membership may have occurred. Membership on these committees shall not in and of itself constitute an endorsement by the committee members', employers of AHRI, or any document developed by the committee on which the member serves.

Note: The AHRI Standards Style Guide was developed internally. The Ad Hoc Standards Style Guide Committee developed the 2022 Standards Style Guide but did not vote to approve the document.

AHRI Ad Hoc Standards Style Guide Committee Scope: The scope of the AHRI ad hoc standards style guide committee was to update the existing format and content requirements for AHRI standards and guidelines (*Appendix A* of the *2018 Standards Policy and Procedure*) into a Standards Style Guide.

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Section 1. Objectives of AHRI Standards Style Guide and Principles for Development of Standards and Guidelines

1.1 *Objective of the AHRI Standards Style Guide*

The AHRI Standards Style Guide is a manual that provides formatting rules, defines the elements of documents, defines normative and informative language, provides rules for normative and informative sections of documents, specifies editorial style, and is an example of formatting elements of a document.

The objectives of the AHRI Standards Style Guide include:

- to provide an all-purpose guide as a resource for AHRI staff and committees for the development of AHRI standards and guidelines
- to provide answers to writing, style, and formatting questions
- to maintain consistency and quality of AHRI standards and guidelines

1.1.1 *How the Guide is Arranged*

The Standards Style Guide is divided into eight sections:

- Objectives of AHRI Standards Style Guide and Principles for Development of Standards and Guidelines
- Definitions
- Document Structure
- Editorial Style
- Document Elements
- Copyright and Permissions
- Units of Measure in AHRI Standards and Guidelines
- Interpretations Format and Numbering

1.2 *Objective of Standards*

This AHRI Standards Style Guide defines the rules for structure, format, and content of AHRI standards and guidelines. Standards and guidelines are defined in the AHRI Standards Policy & Process document, latest edition.

The objective of AHRI standards and guidelines is to specify clear and unambiguous provisions to promote international trade and communication. To achieve this objective, standards and guidelines documents shall:

- Be complete within the limits specified by their scope. When a standard or guideline provides requirements or recommendations, these are either written explicitly, or made by reference to other documents.
- Be internally consistent within each document.
- Be clear and accurate to prevent misinterpretation or misunderstanding to a person having competence in the field.
- Be comprehensible to qualified people who have not participated in their preparation.
- Be concise, not using more words than necessary to convey the idea.
- Be written using existing knowledge about the state of the art and reflect current accepted or best practices.
- Take into account the current market conditions; acknowledging the tradeoffs between what is technically feasible and what the market demands. Provide a framework for future technological development.
- Conform to the *AHRI Standards Policy & Procedures* and this *AHRI Standards Style Guide.*

AHRI standards and guidelines are voluntary; a standard does not by itself impose any obligation upon anyone to follow it. However, an obligation can be imposed, for example, by adoption of the standard into regulation or legislation or by a contract that refers to the standard. An AHRI standard or guideline shall not include contractual requirements (for example, concerning claims, guarantees, covering of expenses) and legal or statutory requirements.

1.3 *Development and Approval*

The procedure for development and approval of standards and guidelines is given in the *AHRI Standards Policy & Procedures*. The procedure given in the *AHRI Standards Policy & Procedures* shall be applied throughout all stages of drafting.

1.4 *Performance Principle*

Not all characteristics of an item or a subject can be, or need be, standardized. The choice of characteristics to be standardized depends on the purpose of the document, for example, product standard, application standard, or guideline. A functional analysis of the product can help to identify the characteristics to be included in the document.

Requirements shall be expressed in terms of performance rather than design or descriptive characteristics. This principle allows maximum freedom for technical development and reduces the risk of unfavorable market impacts (for example, limiting development of innovative solutions).

When the performance principle is adopted, it shall be confirmed that important features are not inadvertently omitted from the performance requirements.

Requirements concerning the manufacturing process shall be omitted in favor of tests to be made on the final product.

The choice between specifying by description or by performance is important because specification by performance can lead to complicated, costly, and lengthy testing procedures.

1.5 *Verifiability*

Requirements shall be objectively verifiable. Only those requirements that can be verified shall be included.

Subjective phrases such as “sufficiently strong” or “of adequate strength” shall not be used.

The stability, reliability or lifetime of a product shall not be specified if there is not a test method known that can verify the claim in a specified time. A guarantee by the manufacturer is not a substitute for such requirements. Guaranteed conditions shall not be included because these are commercial or contractual, rather than technical, in nature.

1.6 *Consistency*

Consistency should be maintained within each document, and within a series of associated documents.

- The structure of associated documents and the numbering of their clauses should be identical.
- Identical wording should be used to express identical provisions.
- The same terminology should be used throughout. Synonyms should not be used.

Consistency is particularly important to help the user understand documents or series of associated documents, and when using automated text processing techniques and computer-aided translation.

1.7 *Prevention of Duplication and Unnecessary Deviations*

Standards and guideline documents should abstain from duplication with other AHRI standards and guidelines, or those from other organizations. This is particularly important in test methods, that are often applicable to more than one product, or type of product.

Before developing a standard on any item or subject, the developing committee shall determine whether an applicable standard already exists at AHRI or elsewhere. If it is necessary to invoke a requirement that appears elsewhere, this should be done by reference, not by repetition.

If a test method is, or can be, applicable to two or more types of products, a document shall be prepared on the method itself, and each document dealing with a given product shall refer to it (indicating any modifications that can be necessary). This will help to prevent unnecessary deviations.

The requirements for one item or subject should be confined to one document.

The document should be written in a manner specifying generic requirements applicable to a group of items or subjects.

If the committee determines repetition of a requirement from an exterior source to be necessary, the source shall be referenced precisely (see Section 5.8).

1.8 *Accommodation of More Than One Product Size*

When developing the scope, test requirements, and rating requirements, attention shall be given to all product sizes, variations, and configurations as technically feasible for the given product. Attention shall be given to the global market for the product and the expertise of the STC.

1.9 *Characteristics Not Specified in a Document*

A standard or guideline may list characteristics that can be chosen freely by the supplier. The characteristics chosen shall be stated, for example, on a nameplate, label or accompanying document.

For complex items, it is impractical to specify exhaustive performance requirements. Instead, it is preferable to require that the item be supplied with a list of performance data.

Documents listing characteristics for which suppliers or purchasers are required to state values or other data not specified by the document shall specify how such values are to be measured and stated.

1.10 *Translatability*

AHRI standards and guides will be translated and published in a local language. There is a requirement to translate into French those standards intended for Canadian (SCC) approval. AHRI promotes the adoption of AHRI standards in other countries and regions, so other standards may need to be translated into other languages as well. Even for standards that will not be translated the document should be written in manner that allows for translation as these same guidelines will help make standards more readable, especially for those readers whose native language may not be American English.

Committees developing standards can make the document more translatable by

- Not using colloquialisms or slang
- Using correct English
- Using terminology consistently, such as. always using a word or product name in the same manner, and not using synonyms for second uses.
- Using words for requirements and recommendations (for example, shall/must and should/may) correctly and consistently
- Use concise and clear language and terminology
- Not using terms that are country, region, or hemisphere specific, or words or examples that are culture-specific
- Not using subjective and unclear terms and phrases such as those found in the prohibited words list in Table 6.

Section 2. Definitions

2.1 *Conditions of a Document*

2.1.1 *Capability*

An expression, in the content of a document, that conveys the ability, fitness, or quality necessary to do or achieve a specified thing.

2.1.2 *External Constraint*

A constraint or obligation on the user of the document (for example, laws of nature or conditions existing in different countries or regions) that is not stated as a provision of the document.

2.1.3 *Permission*

An expression, in the content of a document, that conveys consent or liberty (or opportunity) to do something.

2.1.4 *Profile*

A named combination of options, chosen according to a specified framework, that are necessary to accomplish a particular function.

2.1.5 *Provision*

An expression in the content of a normative document that takes the form of a statement an instruction, a recommendation, or a requirement.

2.1.6 *Recommendation*

An expression in the content of a document that conveys a suggested possible choice or course of action deemed to be advantageous without necessarily mentioning or excluding others.

2.1.7 *Requirement*

An expression, in the content of a document, that conveys objectively verifiable criteria to be fulfilled and where deviation is not permitted if conformance with the document is to be claimed.

2.1.8 *State of the Art*

A developed stage of technical capability at a given time as regards products, processes and services, based on the relevant consolidated findings of science, technology and experience.

2.1.9 *Statement*

An expression, in the content of a document, that conveys information.

2.2 *Elements of a Document*

2.2.1 *Conditional Element*

An element that is present depending on the provisions of the document.

2.2.2 *Informative Element*

An element intended to assist the understanding or use of the document or that provides contextual information about the content, background, or relationship with other documents.

2.2.3 *Normative Element*

An element that describes the scope of the document or sets out provisions.

2.2.4 *Optional Element*

An element that the writer of a document may choose to include or not.

Section 3. Document Structure

3.1 *Document Types*

AHRI standards deliverables, including product standards, application standards, and guidelines, are defined in the *AHRI Standards Policy & Procedures* Section 3.2.

3.2 *Informative or Informational Text*

For AHRI standards, all informative or informational text shall appear in the appendices. Normative text is the default in standards; any informative text shall be clearly identified.

AHRI guidelines are entirely informative.

3.3 *High Level Document Structure*

AHRI standards and guidelines shall include the following structural elements:

- Front Matter (see Section 3.4 below).
- Body, sections for standards contain normative information (see Section 3.5 below).
- Appendices shall be identified as either normative or informative (see Section 3.6 below).

Refer to Table 1 and Table 2 below to see the structural elements in standards and guidelines, and if the these are required, conditional, or optional, and informative or normative.

Table 1 Overview of the Major Sections of a Standard and Their Arrangement

Structural Element	Section	Required / Optional / Conditional	Normative / Informative	See Sections:
Front Matter	Front Cover	Required	Normative	3.4.1
Front Matter	Accreditation(s)	Conditional	Normative	3.4.2 and 3.4.3
Front Matter	Withdrawal Note and Statement on Front Cover and first page after Front Cover	Conditional	Informative	3.4.16
Front Matter	AHRI Copyright on first page after Front Cover	Required	Informative	3.4.4
Front Matter	AHRI Safety Disclaimer	Required	Normative	3.4.5
Front Matter	Supersedure Notice on first page after Front Cover	Required	Informative	3.4.6
Front Matter	Dual Standards Reference Note on first page after Front Cover	Conditional	Informative	3.4.7
Front Matter	Intent Statement on second page after Front Cover	Required	Informative	3.4.9
Front Matter	Review and Amendment Statement on second page after Front Cover	Required	Informative	3.4.10
Front Matter	Origin and Development Statement on second page after Front Cover	Required	Informative	3.4.11
Front Matter	Summary of Changes	Conditional	Informative	3.4.12
Front Matter	Committee Lists	Required	Informative	3.4.13
Front Matter	Consensus Body Lists	Conditional	Informative	3.4.14
Front Matter	Addendum and Errata Page	Conditional	Informative	3.4.15
Front Matter	Table of Contents	Required	Informative	3.4.17
Body	Section 1: Purpose	Required	Normative	3.5.1
Body	Section 2: Scope	Required	Normative	3.5.2
Body	Section 3: Definitions	Required	Normative	3.5.3
Body	Section: Classifications	Optional	Normative	3.5.4
Body	Section: Test Requirements	Required	Normative	3.5.5
Body	Section: Rating Requirements	Required	Normative	3.5.6
Body	Section: Minimum Data Requirements for Published Ratings	Required	Normative	3.5.7
Body	Section: Operating Requirements	Conditional	Normative	3.5.8
Body	Section: Marking and Nameplate Data	Conditional	Normative	3.5.9
Body	Section: Conformance Conditions	Required	Normative	3.5.10
Appendices	Appendix A: References - Normative	Required	Normative	3.6.1
Appendices	Appendix B: References - Informative	Required	Informative	3.6.2
Appendices	Appendix: Methods of Testing for Rating Equipment - Normative	Optional	Normative	3.6.3
Appendices	Additional Appendices	Optional	Informative or Normative	3.6.4

Table 2 Overview of the Major Sections of a Guideline and Their Arrangement

Structural Element	Section	Required / Optional / Conditional	See Sections:
Front Matter	Front Cover	Required	3.4.1
Front Matter	Withdrawal Note and Statement on Front Cover and first page after Front Cover	Conditional	3.4.16
Front Matter	AHRI Copyright on first page after Front Cover	Required	3.4.4
Front Matter	AHRI Safety Disclaimer	Required	3.4.5
Front Matter	Supersedure Notice on first page after Front Cover	Required	3.4.6
Front Matter	Dual Guideline Reference Note on first page after Front Cover	Conditional	3.4.7
Front Matter	Intent Statement on second page after Front Cover	Required	3.4.9
Front Matter	Review and Amendment Statement on second page after Front Cover	Required	3.4.10
Front Matter	Origin and Development Statement on second page after Front Cover	Required	3.4.11
Front Matter	Summary of Changes	Conditional	3.4.12
Front Matter	Committee Lists	Required	3.4.13
Front Matter	Addendum and Errata Page	Conditional	3.4.15
Front Matter	Table of Contents	Required	3.4.17
Body	Section 1: Purpose	Required	3.5.1
Body	Section 2: Scope	Required	3.5.2
Body	Section 3: Definitions	Required	3.5.3
Body	Additional Sections	Optional	—
Appendices	Appendix A: References - Informative	Required	3.6.2
Appendices	Additional Appendices	Optional	3.6.4

3.4 *Front Matter*

Document front matter shall only include objective, non-technical meta-information about the document and shall be prepared by AHRI staff independent of the consensus development process.

AHRI standard and guideline documents shall contain the front matter components in the following order: cover title pages, AHRI Copyright, Safety Disclaimer, Supersedure Notice, dual standard reference (if applicable), Intent Statement, Review and Amendment Statement, Origin and Development Statement, summary of changes, committee list(s), consensus body lists (if applicable), and table of contents.

The origin and development statement shall be a comprehensive history of the document from the first edition, including the purposes, major changes in the various editions through the years, and any changes in the committee structure during these periods.

The AHRI standard or guideline document front matter shall not contain AHRI Certification Program provisions, nor normative references to AHRI Certification Programs.

3.4.1 *Front Cover*

Required, Informative

The front cover title page shall carry the AHRI numeric designation for the document; the title of the document; the edition year; the AHRI logo; and the AHRI Address and contact information.

Examples of front covers and front matter are shown in Appendix A.

3.4.2 *American National Standards Institute (ANSI) Designation*

Conditional, Informative

Standards that are approved as American National Standards (ANS) shall follow formatting requirements of ANSI Guidelines for ANSI Logo and Mark Use.

After a standard is approved as an ANS, the AHRI Standards staff shall:

- Update the standard Front Cover Page (see Section 3.4.1) with the ANSI logo and approval date
- Update the standard title in the Page Headers (see Section 3.4.18) in the Body of the standard
- Add the approval date to the Origin and Development Statement (see Section 3.4.11)

See Section 3.2.3 *Naming* in the *AHRI Policy & Procedures for the Development of Standards (2021)* to see how the ANSI designation shall appear in the standard title. AHRI standards that are accredited by ANSI shall have the year in the title remain the same as the original publication if accreditation is approved in a subsequent year.

If a published standard has the ANS accreditation administratively withdrawn, then the AHRI Standards staff shall update the Front Cover Page, Page Headers, and relevant Front Matter information as appropriate.

See the ANSI logo in Figure 1 below.

Figure 1 ANSI logo

3.4.3 *National Standards of Canada (NSC) Designation for Standards Council of Canada (SSC)*

Conditional, Informative

Documents that are approved by the Standards Council of Canada (SCC) must follow formatting requirements of the *Requirements & Guidance – Accreditation of Standards Development Organizations.*

After a standard is approved as an NSC, the AHRI Standards staff shall:

- Update the standard Front Cover Page (see Section 3.4.1) with the SCC logo and approval date,
- Update the standard title in the Page Headers (see Section 3.4.18) in the Body of the standard,
- Add the approval date to the Origin and Development Statement (see Section 3.4.11).
- Add Front Matter information required by the SCC *Requirements & Guidance – Accreditation of Standards Development Organizations*.
- Publish the French translation.

See Section 3.2.3 *Naming* in the *AHRI Policy & Procedures for the Development of Standards (2021)* to see how the SCC designation shall appear in the standard title. AHRI standards that are accredited by SCC shall have the year in the title remain the same as the original publication if accreditation is approved in a subsequent year.

If a published standard has the NSC accreditation administratively withdrawn, then the AHRI Standards staff shall update the Front Cover Page, Page Headers, and relevant Front Matter information as appropriate.

See the bilingual SCC logos in Figure 2 and Figure 3.

Figure 2 SCC Logo Bilingual English First

Figure 3 SCC Logo Bilingual French First

3.4.4 *AHRI Copyright*

Required, Informative

The AHRI copyright statement and image with the published year shall appear centered at the top of the first front matter page above the Safety Disclaimer. See the AHRI Copyright example below.

3.4.5 *AHRI Safety Disclaimer*

Required, Informative

The safety disclaimer shall be placed below the AHRI Copyright Statement on the first front matter page, after the front cover of each standard as shown here. The required wording follows:

IMPORTANT

SAFETY DISCLAIMER

AHRI does not set safety standards and does not certify or guarantee the safety of any products, components or systems designed, tested, rated, installed or operated in accordance with this standard/guideline. It is strongly recommended that products be designed, constructed, assembled, installed and operated in accordance with nationally recognized safety standards and code requirements appropriate for products covered by this standard/guideline.

AHRI uses its best efforts to develop standards/guidelines employing state of the art and accepted industry practices. AHRI does not certify or guarantee that any tests conducted under its standards/guidelines will be non-hazardous or free from risk.

3.4.6 *Supersedure Notice*

Required, Informative

The appropriate statement identifying the version of a document shall be placed inside the first page following the front cover page of standards as shown here.

If a first-generation document is created, use the following required wording:

Note:

This is a new [standard/guideline]; a prior version does not exist.

The required wording for revised documents follows:

Note:
This [standard/guideline] supersedes AHRI [Standard/Guideline] [number]-[year] [(units)]

If a document is reaffirmed, the following required wording shall follow the new standard or revised standard note:

Note:
This [standard/guideline] was reaffirmed [Month Year].

If a document is withdrawn, the following required wording new standard, revised standard, or reaffirmed standard note:

Note:
This [standard/guideline] was withdrawn [Month Year].

3.4.7 *Dual Standards Reference Note*

Conditional, Informative

The reference to the dual document in I-P or SI units shall appear below the Supersedure Notice.

Note:
This [standard/guideline] supersedes AHRI Standard [number]-[year] [(units)]
For [units] ratings see AHRI [Standard/Guideline] [number]-[year] [(units)]

3.4.8 *AHRI Certification Program Disclaimer*

Required, Informative

The AHRI Certification Disclaimer statement shall appear below the Supersedure Notice and Dual Standards Reference Note (if applicable). See the AHRI Certification Disclaimer below.

AHRI CERTIFICATION PROGRAM DISCLAIMER
AHRI Standards are developed independently of AHRI Certification activities and can have scopes that include products that are not part of the AHRI Certification Program. The scope of the applicable AHRI Certification Program can be found on AHRI's website at http://www.ahrinet.org.

3.4.9 *Intent Statement*

Required, Informative

All AHRI standards and guidelines shall have an Intent Statement. It shall appear on the second front matter page after the cover page. See the example of the Intent Statement below.

Intent
This standard is intended for the guidance of the industry, including manufacturers, engineers, installers, contractors, and users.

3.4.10 *Review and Amendment Statement*

Required, Informative

All AHRI standards and guidelines shall have a Review and Amendment Statement. It shall appear on the second front matter page after the Intent Statement. See the example of the Review and Amendment Statement below.

Review and Amendment
This standard is subject to review and amendment as technology advances.

3.4.11 *Origin and Development Statement*

Required, Informative

All AHRI standards and guidelines shall have an origin and development statement prepared by AHRI staff, independent of the consensus development process. It shall not contain requirements, permissions, or recommendations.

This statement shall appear on the second front matter page after the Review and Amendment Statement. If the standard has accreditation from ANSI or SCC, it shall include a statement indicating the date of ANSI or SCC approval, or both. An effective date is optional. The running summary of changes and the level of detail should be a couple of paragraphs or bullets. See the example of the Origin and Development Statement below.

202x Edition

This edition of AHRI Standard [number-year (units)], Performance Ration of XXXX was prepared by the XXXX Standards Working Group / XXXX Standards Technical Committee. It was approved by the XXX Standards Subcommittee on Day Month year, [with an effective date of Day Month Year].

Origin and Development of AHRI [number]

In 2005 the XXX Product Section identified the need for XXXXX and developed the first edition to provide a new definition of XXX.

In 2010 the standard was reaffirmed.

In 2015 an appendix was adopted to provide guidance to the AHRI Committees, regulatory officials, and other that addressed XXXX.

In 2020 the standard was extensively rewritten to introduce nomenclature related to XXXX.

3.4.12 *Summary of Changes*

Conditional, Informative

If a document supersedes a previous addition, or replaces a withdrawn document, then a sentence or paragraph shall be added to the origin and development statement outlining substantive changes in the latest revision. This should not be a detailed list of specific changes but instead a summary of topics addressed and rationale for changes. See the Summary of Changes example below.

AHRI Standard [number-year (units)] contains the following updates to the previous edition:

- XXXX language has been consolidated into one central section
- Definitions have been expanded to include XXXX and XXXX
- Language has been added to provide XXXX
- Additional language has been added to clarify XXXX requirements
- An additional procedure has been added to Appendix X and Appendix X
- New provisions have been added for testing XXXX
- Operating conditions have been harmonized with AHRI XXXX and now include XXXX.

3.4.13 *Committee Lists Page*

Required, Informative

The page following the Summary of Changes page shall list the members of the development committee (Standards Technical Committee and, if applicable, the Standards Work Group), and groups giving their approval (Standards Subcommittee and, if applicable, the Consensus Body). The title of the page shall be *Committee Personnel*. These lists shall include only those persons who were voting members of the committees at the time of balloting. The list shall be organized by committee officers (chair and vice chair); company/organization principal members and alternate members, with the principal listed with each alternate's name. The list shall include the name of the chair first, followed by the vice chair second, followed by the primary committee members in alphabetical order by last name and the alternate committee members by last name. This list shall include all member's companies and, if applicable, the organizations represented, and both shall be spelled out in full.

Refer to Section 4.6.4 in the *AHRI Standards Policy and Procedures (2021)* to determine the Interest Category Classification.

The states or countries where the members reside, and the designations of their committee membership classification as defined by AHRI shall be shown.

The AHRI staff liaison(s) assigned to each committee at the time of voting shall be included at the end of the committee list.

See the example committee list below.

[Name] Standards [Working Group / Standards Technical Committee / Standards Subcommittee] for AHRI Standard [number-year (units)]			
Participant	**Interest Category Classification**	**Voting Member Role**	**State / Country**
[Name] [Organization / Company]	[Category]	Chair	
[Name] [Organization / Company]	[Category]	Vice-chair	
[Name] [Organization / Company]	[Category]	[Primary / Alternate to XXX]	
[Name] [Organization / Company]	[Category]	[Primary / Alternate to XXX]	
[Name] [Organization / Company]	[Category]	[Primary / Alternate to XXX]	
[Name] [Organization / Company]	[Category]	[Primary / Alternate to XXX]	
[Name] [Organization / Company]	[Category]	[Primary / Alternate to XXX]	
[Name] [Organization / Company]	[Category]	[Primary / Alternate to XXX]	
[Name of AHRI EA]	AHRI Staff Liaison		

The committee lists shall be followed by a statement that read as follows:

> This list represents the membership at the time the Working Group, Standards Technical Committee and Standards Subcommittee were balloted on the final text of this edition. Since that time, changes in the membership may have occurred. Membership on these committees shall not in and of itself constitute an endorsement by the committee members or their employers of any document developed by the committee on which the member serves.

3.4.14 *Consensus Body Lists*

Conditional, Informative

If a standard is accredited as an ANS or NSC, or both, the Consensus Body List(s) shall appear after the Committee Lists. This list shall include only those persons who were voting members of the Consensus Body at the time of balloting. The list shall be organized by the name of the Consensus Body members in alphabetical order by last name and include the name of the organization or company represented, and both shall be spelled out in full. The states or countries where the members reside, and the Interest Category Classification shall be shown.

Refer to Section 4.6.4 in the *AHRI Standards Policy and Procedures (2021*) to determine the Interest Category Classification.

See the example of the Consensus Body list below:

ANSI Consensus Body for AHRI Standard [number-year (units)]		
Participant	**Interest Category Classification**	**State / Country**
[Name] [Organization / Company]	[Category]	
[Name] [Organization / Company]	[Category]	
[Name] [Organization / Company]	[Category]	
[Name] [Organization / Company]	[Category]	
[Name] [Organization / Company]	[Category]	
[Name] [Organization / Company]	[Category]	
[Name] [Organization / Company]	[Category]	
[Name] [Organization / Company]	[Category]	

The technical committee scope shall be printed following the notes. See the example scope below.

[Name} Standards Technical Committee Scope: This committee shall have responsibility for…

3.4.15 *Addendum and Errata Page*

Conditional, Informative

Addenda and errata are defined in the *AHRI Standards Policy and Process* document. If the standard or guideline has addenda or errata, an addendum or errata page shall appear on a separate page that shall be the first page after the cover page and before the other front matter information.

This page shall include the AHRI Logo at the top of the page, the new standard number indicating the addendum or errata number(s), the title of the standard or guideline, units, and the year and month the addendum or errata is published.

The page title shall read:

The description of the addendum or errata shall include the following statement:

> Addendum/Errata X of AHRI Standard XXX-202X, is provided as follows. The following change has been incorporated (deletions are shown by ~~strikethroughs~~ and additions by shading) into the already published 20XX version of AHRI Standard XXXX to prevent confusion.

Description of the addendum or errata shall follow this statement.

Changes shall appear below the addendum or errata description statement and in the body of the standard in their original location.

Addenda or errata containing multiple items shall be listed numerically in sequence (1., 2., 3…).

If a standard or guideline contains multiple addenda or errata, then each occurrence shall appear sequentially on a separate page, with the most recent addendum or errata appearing first and the first addendum or errata appearing last.

An example of addenda/errata appears in Appendix C.

3.4.16 *Withdrawn Documents*

Conditional, Informative

The STC shall determine if a withdrawn document shall remain published on the AHRI Published Standards and Guides webpage.

Documents that have been withdrawn following Section 7.1.2 of the *AHRI Policy and Procedures (2021)*; shall include a note above the Standard number on the cover page and in the Origin and Development Statement (Section 3.4.11). This note shall be drafted by the STC and approved by the SSC. See the example Front Cover page withdrawal note below.

> Note:
> This [standard/guideline] has been withdrawn because the terms and values produced by using it have not been widely accepted and are no longer supported by the member companies.

The withdrawal note in the Supersedure Note shall show the date of withdrawal.

> Withdrawn from Publication [Month Year]

Note:

This standard has been withdrawn because the terms and values produced by using it have not been widely accepted and are not currently supported by the member companies.

Withdrawn from publication [Month Year].

This standard supersedes AHRI Standard [number-year (units)].

3.4.17 *Table of Contents*

Required, Informative

The table of contents shall start on the page following the committee list page(s). Two levels of section heads shall be included in the Table of Contents.

There shall be separate tables of contents for Section Titles (both body and appendices), Figures, and Tables. Equations shall not be included in the Table of Contents.

See the Table of Contents of this document.

3.4.18 *Page Headers*

The page header shall appear in the main body of the standard beginning on the first page of Section 1 and continuing through the appendices.

The Header shall appear on the top right side of the page and include the AHRI standard number, units, and year of publication. for example, AHRI Standard 3210–2020 (I-P). See the examples for a standard with SCC and ANSI accreditation and a guideline below.

CAN/ANSI/AHRI Standard 3210-2022 (SI/I-P)

AHRI Guideline Z-2022 (SI/I-P)

3.4.19 *Page Numbers*

Page numbers shall begin on the first page of Section 1 and continuing through the appendices.

The page numbers shall appear on the bottom right of the page.

3.5 *Body*

The sections described below shall be used to ensure consistency among the standards and guidelines published by AHRI. In any given standard or guideline, certain section headings listed may be omitted or additional headings may be inserted.

Section headings used in a standard/guideline shall appear in the sequence shown:

3.5.1 *Section 1: Purpose*

Required and Normative

Each standard shall have the purpose clearly defined. The example wording follows:

Section 1. Purpose

The purpose of this standard is to establish for positive displacement Compressors: definitions, test requirements, rating requirements, minimum data requirements for Published Ratings, operating requirements, marking and nameplate data, and conformance conditions.

The purpose for guidelines shall be to establish best practices.

3.5.2 *Section 2: Scope*

Required, Normative

This section should identify unique characteristics of the product/process necessary to define what is included within the standard. This can include specifics regarding application, arrangement, components, and capacities.

The Scope is a normative element because it delimits the subject of the document. The Scope shall not contain requirements, permissions, or recommendations. It shall appear only once in each document and shall be worded as a series of statements of fact.

An exclusion list shall be limited to products that are otherwise within the scope of the standard.

See the example of a Scope with an exclusion statement below.

Section 2. Scope

This standard applies to Infrared Heaters that are Gas-fired High-intensity Infrared Heaters and Gas-fired Low-intensity Infrared Heaters with inputs up to and including 117.5 kW per burner intended for installation in and heating of outdoor spaces.

2.1 Exclusions

This standard does not apply to heaters that do not radiate their energy into a single measuring plane.

3.5.3 *Section 3: Definitions*

Required, Normative

Section 3 shall contain only definitions. All definitions contained within the document shall appear in Section 3, and Section 3 shall include only terms used within the document – except for "should." The boilerplate definition of "should" shall be included in the definitions even if "should" does not appear in the standard.

All definitions shall be numbered individually within Section 3.

The Definitions section is a normative element. It defines how the listed terms shall be interpreted.

To the extent practicable, the ASHRAE Terminology shall be used for defining all terms used in AHRI standards. If terms do not appear in that webpage or are inaccurate for the purposes of the standard, an appropriate definition shall be included in the AHRI standard.

Each entry shall state the term being defined followed by a definition. The part of speech (for example, noun, verb, and adjective) may be identified as needed for clarification. A definition shall only describe the term being defined. Definition entries shall not contain requirements (meaning, no "shall" statements); only text related to defining the term shall be included. Definitions are descriptive and not prescriptive. The term being defined shall not appear in the definition for the term.

The definition entry in Section 3 may cross reference the text of a section for a fuller definition, example, or requirements.

References to other documents or sections of a document, notes, lists, footnotes, cautions, warnings, or figures shall not be permitted in definitions.

An informative note may include synonyms, but the defined term shall be used consistently throughout the document.

All hyphenated definitions shall have the second word lowercased. See the example below.

Ground Source Closed-loop Heat Pump

Where appropriate, the definition shall include the units applicable to the term.

Energy Efficiency Ratio (EER2)

A ratio of the cooling capacity in Btu/h to the Total Power in watts at any given set of Rating Conditions expressed in (Btu/h)/W.

3.5.3.1 *Required Content*

The required wording for the first paragraph in this section shall be:

> All terms in this document shall follow the standard industry definitions in the ASHRAE Terminology website unless otherwise defined in this section.

Primary or critical terms shall be included in the document as well as any terms defined differently than by ASHRAE.

All standards definitions shall have two subsections. Subsection 3.1 shall be titled "Expressions of Provision" and include the terms defined below. Subsection 3.2 shall be titled "Standard Specific Definitions" or "Guideline Specific Definitions" and include definitions relevant to the document. The following definitions shall be included in subsection 3.2 if used in the standard:

Expressions of Provision

Terms that provide clear distinctions between requirements, recommendations, permissions, options, and capabilities.

"Can" or "cannot"

Express an option or capability.

"May"

Signifies a permission expressed by the document.

"Must"

Indication of unavoidable situations and does not mean that an external constraint referred to is a requirement of the document.

"Shall" or "shall not"

Indication of mandatory requirements to strictly conform to the standard and where deviation is not permitted.

"Should" or "should not"

Indication of recommendations rather than requirements. In the negative form, a recommendation is the expression of potential choices or courses of action that is not preferred but not prohibited.

Standard Specific Definitions

Bubble Point

Refrigerant liquid saturation temperature at a specified pressure.

Coefficient of Performance (COP)

A ratio of the cooling/heating capacity in watts to the power input values in watts at any given set of *rating conditions* expressed in watts/watt.

Standard Coefficient of Performance

A ratio of the capacity to power input value obtained at *standard rating conditions*.

Cooling Capacity

The capacity associated with the change in air enthalpy that includes both the *latent* and *sensible capacities* expressed in watts.

Latent Capacity

Capacity associated with a change in humidity ratio.

Sensible Capacity

Capacity associated with a change in dry-bulb temperature.

Dew Point

Refrigerant vapor saturation temperature at a specified pressure.

Energy Efficiency Ratio (EER)

A ratio of the *cooling capacity* in Btu/h to the power input value in watts at any given set of *rating conditions* expressed in Btu/(W·h).

Standard Energy Efficiency Ratio

A ratio of the capacity to power input value obtained at *standard rating conditions*.

Heating Capacity

The capacity associated with the change in dry-bulb temperature expressed in watts.

Integrated Energy Efficiency Ratio (IEER)

A weighted calculation of mechanical cooling efficiencies at full load and part load *standard rating conditions* expressed in Btu/W·h.

Integrated Part-load Value (IPLV)

A single number part-load efficiency figure of merit described in Section xxx of this standard.

Published Rating

A statement of the assigned values of those performance characteristics, under stated *rating conditions*, where a unit can be chosen to fit the application. These values apply to all units of the same nominal size and type (identification) produced by the same manufacturer. This includes the rating of all performance characteristics shown on the unit or published in specifications, advertising or other literature controlled by the manufacturer, at stated *rating conditions*.

Application Rating

A rating based on tests performed at rating conditions other than s*tandard rating conditions.*

Standard Rating

A rating based on tests performed at *standard rating conditions*.

Rating Conditions

Any set of operating conditions where a single level of performance results and causes only that level of performance to occur.

Standard Rating Condition

Rating conditions used as the basis of comparison for performance characteristics.

Standard Air (definition used in SI standards)

Air weighing 1.204 kg/m^3 that approximates dry air at 21°C and at a barometric pressure of 101.3 kPa.

Standard Air (definition used in I-P versions of Dual Standards as defined in *AHRI Standards Policy and Procedure* document Section 3.3.2)

Air weighing 0.075 lb/ft^3 that approximates dry air at 70°F and at a barometric pressure of 29.92 in Hg.

Standard Air (definition used in Joint Standards as defined in *AHRI Standards Policy and Procedure* document Section 3.3.3)

In SI units, air weighing 1.204 kg/m^3 that approximates dry air at 21°C and at a barometric pressure of 101.3 kPa.

In I-P units, air weighing 0.075 lb/ft^3 that approximates dry air at 70°F and at a barometric pressure of 29.92 in Hg.

3.5.3.2 *Hierarchy of Entries*

Definition entries in Section 3 shall be divided into primary entries and optional secondary and tertiary entries.

Primary and secondary entries shall consist of either of the following:

- An individual noun or a noun/modifier combination that is not part of a set. For example, “Fin”, “Fin Configuration”, and “Fin Pitch” are all individual main entries.
- A noun or a noun/modifier combination that groups a set of subentries. For example, “Coil’ is a main entry that groups subentries “Bare Tube Coil”, “Forced-circulation Air-cooling Coil”, and “Forced-circulation Air-heating Coil”.

Where a primary entry consists of a noun (for example, “coil” or “pressure”) that serves to group sets of related secondary entries, the primary entry shall not be required to carry a definition. A secondary entry grouping a set of tertiary entries does not need a definition.

Secondary entries shall consist of terms that define specific types or examples of the primary entry. For example, “maximum pressure” and “minimum pressure” are secondary entries that define types of the primary “entry pressure”. Tertiary entries shall consist of terms that define specific types of secondary entries. See the example of primary, secondary, and tertiary terms below.

Energy Efficiency

Cooling Energy Efficiency

Cooling Coefficient of Performance (COPR)

A ratio of the Net Refrigerating Capacity to the Total Input Power at any given set of Rating Conditions. (Refer to Equation 10a).

Energy Efficiency Ratio (EER)

A ratio of the Net Refrigerating Capacity to the Total Input Power at any given set of Rating Conditions. (Refer to Equation 10b)

Power Input per Capacity (kw/tonR)

A ratio of the Total Input Power to the Net Refrigerating Capacity at any given set of Rating Conditions. (Refer to Equation 10c).

3.5.3.3 *Alphabetizing Entries*

Primary entries shall be listed in alphabetical order within Section 3. Secondary entries shall be listed in alphabetical order under the primary entry, and tertiary entries shall be listed alphabetically under the secondary entry.

3.5.3.4 *Numbering Entries*

All entries shall have section numbers.

Primary definition entries shall be numbered consecutively using a second-level heading.

Secondary definition entries shall be numbered consecutively using a third-level heading.

Tertiary definition entries shall be numbered consecutively using a fourth-level heading.

3.5.3.5 *Acronyms and Uncommon Abbreviations*

If an acronym is to be used in the standard, it shall be included in parentheses after the initial use of the defined term, for example, "Coefficient of Performance (COP)". Each subsequent use within a section should be the acronym or abbreviation only.

3.5.4 *Section: Classifications.*

Optional, Normative

If this section appears, it shall take the sequential number after Section 3.

It can be necessary to separate a product line into distinct classifications to help identify unique characteristics or applications. Such classifications can be by unit size, physical orientation, capacity, operating characteristics, method of heating or cooling or any other designation that can clarify the intended usage and prescribed performance.

Table 3 is an example of classifications for water-source heat pumps:

Table 3 Example of Classification of Water-Source Heat Pumps

Designation	**AHRI Type**	***Arrangement**	
Single Package (Ducted)	HSP-W	FAN	COMP
		EVAP	COND
Single Package (Free Delivery)	HSP-W-O	FAN	COMP
		EVAP	COND
Split System (Ducted)	HRCU-W	FAN	COMP
		EVAP	COND
Split System (Free Delivery)	HRCU-W-O	FAN	COMP
		EVAP	COND
*Denotes Cooling Mode Function			

3.5.5 *Section: Test Requirements*

Required, Normative

This section identifies all procedures and conditions necessary for testing the product. The appropriate test standard should be referenced, or if a standard does not exist, one should be developed and included in Appendix C. If testing must be done at conditions not specified within the test standard, these testing conditions shall be included in this section.

3.5.6 *Section: Rating Requirements*

Required, Normative. If a standard does not have any rating requirements, the section shall show "none."

This section shall define the standard rating conditions, identify the rating data to be published (such as, capacity, EER, air flow, IPLV, and sound) and establish the verification testing uncertainties that apply to the rating data. Proposed wording for verification testing uncertainties follows:

> *Verification Testing Acceptance Criteria*
>
> To comply with this standard, measured test results shall not be less than [xx]% of Published Rating for performance ratios and capacity; shall not exceed [yy]% of Published Ratings for power; and shall not exceed [zz]% of Published Ratings for pressure drop.

In addition, this section should discuss all other aspects of rating data for the equipment covered by the standard. This should include defining part-load rating conditions or Application Ratings, or both, and their usage. If the values of the rating data must be expressed in specific units or certain increments, these should be specified in this section.

3.5.7 *Section: Minimum Data Requirements for Published Ratings*

Required, Normative

The minimum data requirements for Published Ratings shall include those performance characteristics, at Standard Rating Conditions, by which a product may be chosen to fit the application. At minimum, the following required wording shall be included in the standard:

> *Minimum Data Requirements for Published Ratings*
>
> As a minimum, Published Ratings shall include all Standard Ratings. All claims to ratings within the scope of this standard shall include the statement "Rated in accordance with AHRI Standard [xxx]". All claims to ratings outside the scope of this standard shall include the statement "Outside the scope of AHRI Standard [xxx]". Application Ratings within the scope of the standard shall include a statement of the conditions under which the ratings apply.

3.5.8 *Section: Operating Requirements*

Conditional, Normative.

When production units are required to meet minimum operating requirements, these requirements shall be identified in this section. Examples of such operating requirements follow:

1) Maximum Operating Conditions
   a) Ambient Air Temperature
   b) Condenser Entering Water Temperature
   c) Indoor Air Temperature
   d) Water Flow Rates
2) Minimum Operating Conditions
   a) Ambient Air Temperature
   b) Condenser Entering Water Temperature
   c) Indoor Air Temperature
   d) Water Flow Rates
3) Voltage (Minimum and Maximum)
4) Insulation Efficiency
5) Condensate Disposal
6) Air Infiltration

3.5.9 *Section: Marking and Nameplate Data*

Conditional, Normative

This section shall require that the nameplate, as a minimum, displays the model number and the name of the manufacturer or supplier responsible for the performance rating. Additionally, where applicable, it shall require electrical characteristics to be displayed. In such cases, at least the following wording shall be included in the standard:

> Nameplate voltages for 60 Hertz systems shall include one or more of the equipment nameplate voltage ratings shown in AHRI Standard 110. Nameplate voltages for 50 Hertz systems shall include one or more of the utilization voltages in AHRI Standard 110 or IEC Standard 60038.

3.5.10 *Section: Conformance Conditions*

Required, Normative

The required wording follows:

> *Conformance.*
>
> While conformance with this standard is voluntary, conformance shall not be claimed or implied for products or equipment within the standard's Purpose (Section 1) and Scope (Section 2) unless such product claims meet all of the requirements of the standard and all of the testing and rating requirements are measured and reported in complete compliance with the standard. Any product that has not met all the requirements of the standard shall not reference, state, or acknowledge the standard in any written, oral, or electronic communication.

3.6 *Appendices*

Each standard shall contain required appendices and optional additional appendices. Appendices shall each be designated as Normative (mandatory language) or Informative (non-mandatory language).

Appendices can contain all the structural elements (including paragraphs, tables, and figures) as found in the document body, as described in Section 5.8.

Appendices are numbered sequentially using capital letters (A, B, C…) Section numbering shall begin with the appendix letter followed by the section number (A.1, A.2, A.1.1, A.2.1…). Table, figures, and equations shall be numbered continuously from the body of the document.

The required order for appendices is as follows.

3.6.1 *Appendix: References - Normative*

Conditional, Normative

Listed here are all standards, handbooks, and other publications essential to the formation and implementation of the standard. All references in this appendix are part of the standard. A reference must be identified within the standard or normative appendices if it is to be included in Appendix A.

Normative references are required in standards and shall be Appendix A. If a standard does not have any normative references Appendix A shall show "none."

Guidelines shall not have normative appendices.

See Section 5.8.2 for formatting of these references and an example in Appendix B of this style

3.6.2 *Appendix: References - Informative*

Required, Informative

Listed here are standards, handbooks and other publications that provide useful information and background but are not essential. References in this appendix are not part of the standard. If there are no informative references in a standard show "None".

All informative references included in a standard shall be listed in Appendix B.

For guidelines, all references are informative and shall be listed Appendix A.

See Section 5.8.2 for formatting of these references and an example in Appendix B of this style

3.6.3 *Appendix: Methods of Testing for Rating Equipment - Normative*

Optional, Normative

If no appropriate test standard exists or if ASHRAE is unable to prepare one in a timely manner, one should be developed by the developing committee and be included in this appendix. It should contain all information included in an ASHRAE standard. If there are no methods of test defined in a standard show "None".

Methods of Testing for Rating Equipment – Normative references shall be the next alphabetical letter in standards.

Guidelines shall not have normative appendices.

See Section 5.8.2 for formatting of these references.

3.6.4 *Additional Appendices*

If additional appendices are required, these shall appear in the order of relative importance. All appendices shall be identified as "normative" or "informative".

Guidelines shall not have normative appendices.

See Section 5.8.2 for formatting of these references.

Section 4. Editorial Style

Editorial style shall focus on the grammatical format used throughout the document. See Section 7 for the use of units in SI and I-P versions of the standard.

4.1 *Style*

Style, including grammar, punctuation, and conventional presentation of text, shall conform to the recommendations of *The Chicago Manual of Style, 17th Edition*.

4.2 *Inclusive Terminology*

Inclusive terminology shall be used to describe technical capabilities and relationships. Insensitive, archaic, and non-inclusive terms shall not be used. Terminology perceived or expected to be perceived as welcoming by everyone, regardless of their sex, gender, race, color, religion, age, ableness, ethnicity, or nationality shall be used.

New documents shall be developed using inclusive terminology. Existing and legacy documents shall be updated to identify and replace non-inclusive terms with alternatives that are more descriptive and tailored to the technical capability or relationship.

4.3 *Spelling*

Spelling and definitions of common words and terms shall follow *Webster's Collegiate Dictionary, 11th edition.*

When a choice of spelling is given in *Webster's*, the simpler form shall be used in AHRI documents.

Specific HVAC-related terminology shall have the spellings and meanings as set forth in the *ASHRAE Terminology* found on the ASHRAE website.

When a standard definition is needed, *Webster's* shall be utilized where the meaning is correct and accurate as used in AHRI documents

4.4 *Capitalization*

Capitalization shall follow conventional usage, including the capitalization of proper names.

4.4.1 *Titles, Figure Titles and Table Titles, and Text Headings*

Titles shall follow the *Chicago Manual of Style 17th Edition*, Section 8.159 Principles of headline-style capitalization. The conventions of headline style are governed mainly by emphasis and grammar. The following rules are intended to facilitate the consistent styling of titles:

1) Capitalize the first word in titles and subtitles, and capitalize all other major words (nouns, pronouns, verbs, adjectives, adverbs, and conjunctions listed in rule 4).
2) Lowercase the articles "the," "a," and "an."
3) Lowercase prepositions, regardless of length, except when used adverbially or adjectivally ("up" in "Look Up," "down" in "Turn Down," "on" in "The On Button," "to" in "Come To") or when prepositions compose part of a Latin expression used adjectivally ("De Facto," "In Vitro").
4) Lowercase the common coordinating conjunctions "and," "but," "or," "for," and "nor."
5) Lowercase "to" as a preposition (rule 3), and as a part of an infinitive ("to Run," "to Hide"), and lowercase "as" in any grammatical function.
6) Lowercase the part of a proper name that are lowercased in text, such as "de" or "von."

4.4.2 *Terms*

Terms such as grade, class, specimen, and type shall be capitalized when the reference is specific.

4.4.3 *Defined terms*

If a term defined in Section 3 is used within the text of the standard the term shall be italicized.

4.5 *Abbreviations*

Accepted editorial procedures of specialized publications in the specific technical field shall be used as a guide to abbreviations.

4.5.1 *Acronyms and Uncommon Abbreviations*

All acronyms and any abbreviations that are not in common use shall be spelled out with the acronym or abbreviation following in parentheses for the first use of the term in the document. Each subsequent use shall be the acronym or abbreviation only.

Acronyms shall be defined in the Definitions section.

4.6 *Units of Measure*

When accompanied by a specific quantity, all units of measure shall be abbreviated. Units of time shall be spelled out.

Units of measurement abbreviation rules

- Inches and feet shall be abbreviated as "in" and "ft"
- Meters shall be abbreviated as "m"

Spacing Rules follow *Chicago Style Manual 17th Edition*, Section 10.58

- Degrees and percentages shall not have a space between the number and the symbol
- There shall not be a space between a degree symbol and F or C
- A tolerance with a plus-minus symbol shall have a space between the symbol and number
- A negative indicator shall not have a space between the symbol and the number

All other units shown in

- Table 4 shall have a space between the number and the units

Examples for spacing rules:

- 12%
- 12°C
- ± 12
- -12

Table 4 Examples of Commonly Used Units

Characteristic	I-P Description	Designation	
		I-P	SI
Cooling or Heating Capacity	Btu per hour	Btu/h	W
Energy Efficiency Ratio (EER)	Btu per hour per Watt	(Btu/h)/W	W/W
Flow Rate	cubic feet per minute	cfm, ft^3 /min	m^3/s
	gallons per minute	gpm	L/s
Heat Transfer Coefficient	Btu per hour ·square foot ·degree Fahrenheit	Btu/ h·ft^2 °F	W/ M ^{2} °C
Length	Feet	ft	mm, m
	Inches	in	mm
Percentage	percent	%	%
Power	Watts	W	kW
Pressure	pounds per square inch	psi, lb/in^2	kPa
	inches of mercury	in Hg	kPa
	inches of water	in H_2O	kPa, Pa
Rotational Speed	revolutions per minute	rpm	rev/s
Standard Air Flow Rate	Standard cubic feet per minute	scfm	m^3 /s of standard air
Temperature	thermodynamic	°F	°C
	difference	R	K
Time	seconds	s	S
	minutes	min	min
	Hours	h	H
Velocity	feet per second	fps, ft/s	m/s
	feet per minute	fpm, ft/min	m/s
Weight	Pounds	lb	Kg

4.7 *Punctuation*

Punctuation shall follow conventional usage as set forth in *The Chicago Manual of Style.*

4.7.1 *Use of Periods with Titles and Headings*

Periods shall not be used after the main title of a document, after section titles, after table titles, or at the end of appendix titles.

4.7.2 *Use of Periods with Figure Captions*

Periods shall not be used at the end of figure captions.

4.7.3 *Use of Periods with Abbreviations*

Periods shall not be used in abbreviations of units of measure unless the omission of the period can cause confusion (for example, “in.”, not “in”, for “inch”).

4.8 *Number Separators in I-P and SI Units*

I-P and Joint versions of documents shall use U.S. formatting, with commas as separators for thousands, and a period for decimal numbers. Numbers less than 10,000 shall not include a separator for the thousands place.

9000
10,000
98.6

For SI versions of documents, numbers shall be formatted using a European style with a space as a separator for thousands, and comma as decimal.

9000
10 000
98,6

4.9 *Normative and informative language*

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.

4.9.1 *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
- Appendices marked “normative”
- Tables in normative sections are normative unless labeled otherwise
- Figures

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

- Front Matter
- Notes to text, tables, and figures
- Appendices marked “informative,” for example, Appendix B
- Tables in informative sections
- Figures (Figures that appear in normative sections are normative unless otherwise specified. See example below.)

Figure X Example of Informative Figure in Normative Section (Informative)

4.10 *Expressions of Provisions*

The user of the document shall be able to identify the requirements necessary to claim conformance to a document. The user shall be able to distinguish these requirements from other types of provision (recommendations, permissions, possibilities, and capabilities). See Table 5 for where and when to use each provision.

Table 5 Expressions of Provisions in Normative and Informative Sections

Type of Provision Expressed	Term(s) Used	Normative Sections	Informative Sections and Guidelines	See Sections
Requirements	"shall" and "shall not"	Allowed	Not allowed	4.10.1
Recommendations	"should" and "should not"	Allowed in informative notes	Allowed	4.10.2
Permission	"may"	Not allowed	Allowed	4.10.3
Possibility or capability	"can" and "cannot"	Allowed	Allowed	4.10.4
External constraints	"must"	Allowed	Allowed	4.10.5

4.10.1 *Terms Used to Express Requirements (Shall and Shall Not):*

The words "shall" and "shall not" indicate mandatory requirements strictly to be followed to conform to the standard and where deviation is not permitted.

"Shall" and "shall not" are used only in normative sections. Informative sections and guidelines shall not include "shall" or "shall not" requirements

"Shall" is the required term that is to be used in place of:

- is to
- is required to
- it is required that
- has to
- only … is permitted
- it is necessary
- Must (see Section 4.10.5 for where "must" is used)
- Will

"Shall not" is the required term that is to be used in place of:

- is not allowed [permitted] [acceptable] [permissible]
- is required to be not
- is required that … be not
- is not to be
- do not
- May not
- Will not

4.10.2 *Terms Used to Express Recommendation (Should and Should Not)*

"Should" and "should not" are used in normative and informative sections to express recommendations rather than requirements. When used in normative sections "should" and "should not" shall appear in explanatory notes. See Section 5.6.

In the negative form, a recommendation is the expression that a suggested possible choice or course of action is not preferred but it is not prohibited.

"Should" is required term that is to be used in place of:

- it is recommended that
- ought to

"Should not" is the required term that is to be used in place of:

- it is not recommended that
- ought not to

4.10.3 *Terms Used to Express Permission (May)*

"May" signifies a permission expressed by the document, whereas "can" refers to the ability of a user of the document or to a possibility. "May" is used only informative sections.

"May" is the required term that is to be used in place of:

- Is permitted
- Is allowed
- Is permissible

Do not use:

- "Possible" or "impossible" in this context
- "Can" instead of "may" in this context
- "Might" instead of "may" in this context

Negative permissions are ambiguous and should not be used. Rather than using negative permissions, either rewrite the sentence to state what is permitted, or rewrite as a requirement or recommendation not to do something.

4.10.4 *Terms Used to Express Possibility or Capability (Can and Cannot)*

"Can" is the required term that is to be used in place of:

- be able to
- there is a possibility of
- it is possible to

"Cannot" is the required term that is to be used in place of:

- be unable to
- there is no possibility of
- it is not possible to

Do not use "may" instead of "can" in this context.

"May" signifies a permission expressed by the document, whereas "can" refers to the ability of a user of the document or to a possibility.

4.10.5 *Term Used to Express External Constraint (Must)*

External constraints are not requirements of the document. These are given for the information of the user. See the definition in Section 2.1.2.

"Must" is the required term.

"Must" is used in normative and informative sections.

The word "must" shall not be used when stating mandatory requirements; "must" is used only to describe unavoidable situations.

Use of the word "must" does not indicate that the *external constraint* referred to is a requirement of the document.

Do not use "must" as an alternative for "shall". This prevents confusion between the requirements of a document and *external constraints*.

See the examples of *external constraints* below:

Conditions existing in a country:

1) Because Japan is a seismically active country, all buildings must be earthquake resistant.

A law of nature:

2) All fish must maintain a balance of salt and water in their bodies to stay healthy.

4.11 *Vague and Imprecise Words and Phrases*

Words and phrases used in AHRI standards and guidelines shall be clear and not subject to misinterpretation. Subjective, unclear, vague, or commonly misinterpreted terms or phrases such as "approximately equal" and "acceptable" shall not be used. Exact words such as stating a tolerance shall be used instead. Words such as "full," "partial," "maximum," and "intermediate" must be clearly defined when used to prevent misunderstanding.

Vague wording causes problems for the understanding of non-native English speakers, as well as for the translation of the standard or guideline into other languages. See Section 1.10 Translatability.

The words and phrases listed in Table 6 should not be used in AHRI standards and guidelines. The SWG or STC shall review the document for the presence of the words in Table 6. If the words in Table 6 are used in a document, the SWG or STC shall provide a justification for their use.

Table 6 Vague and Imprecise Words and Phrases

acceptable	adequate (ly)	advise	also
and/or	and the like	appreciable	approximate (ly)
aspire	available	avoid (ed)	care
careful (ly)	consider (ed) (ation)	could	chance (on the chance)
desire (ed) (able)	easy (ily)	effectively	e.g.
encourage	ensure	equivalent (ly)	etc.
exception	excess (ive)	familiar	feasible
few	firm (ly)	frequent (ly)	general (ly) (ize)
good	grant	guide (line)	i.e.
imply	infer	in lieu of	insure
it (s)	legible (ly)	light (ly)	like (ly)
many	maybe	might	most (ly)
near (ly)	neat (ly)	no	note
ought / ought to	normal (ly)	periodic (ally)	possible
practical (ly)	practice	preferred	presume
probable (ly)	properly	ready (ily)	reasonable (ly)
recommend (ation)	request	safe (ly)	satisfactory
secure (ly)	several	significant (ly)	similar
some	substantial (ly)	sufficient (ly)	suitable
suggest (tion)	them	they	typical (ly)
which	would	urge	usual (ly)
via	vice versa	—	—

4.12 *Rounding, Significant Figures, and Precision*

Based on the calculations, measuring methods, and technology covered by a standard or guideline, deviations from conventional rounding, significant figure, and precision methods may be needed. All deviations to conventional procedures shall be provided in the standard or guideline. Otherwise, it shall be assumed that the standard or guideline follows conventional methods for rounding, significant figures, and precision.

Section 5. Document Elements

5.1 *Section Numbering*

The body of a standard is divided into major sections that are further divided into subsections. The body and appendix portions of the document shall be arranged, in order of descending importance, into sections, subsections, paragraphs, and subparagraphs. Sections shall be numbered consecutively by adding a period (.) and an Arabic number after the section number (for example, sections in Section 4 shall be numbered 4.1, 4.2, 4.3…, with subsections 4.1.1, 4.1.2, 4.1.3…). In appendices, the appendix letter is followed by a number (for example, A.1, A.2, etc.) with subsections following the same format as body sections (for example, A.1.1, A.1.1.1…).

All sections shall include a title. Sections without a title should instead be paragraphs under the parent heading.

Sections containing multiple requirements shall be subdivided into subsections, that shall be further subdivided into paragraphs, that shall be further divided into subparagraphs of text.

5.1.1 *Headings for Sections, Subsections, Paragraphs, and Subparagraphs*

First-level headings (H1) are for a top-level section and have a single number. Second-level headings (H2) used for subsections have two numbers, for example, 2.1 or A.2. Third-level headings (H3) for paragraphs have three numbers, for example, 2.1.2 or A.2.1. Fourth and fifth level headings (H4 and H5) used for subparagraphs have four and five numbers, for example, 4.1.2.3, 4.1.2.4, and 5.1.2.3.4, 5.1.2.3.5.

Heading levels should not exceed the 5th level of headings. For example, the document may contain a subsection numbered 1.2.3.4.5, but not a section 1.2.3.4.5.6.

Any subsection, paragraph, and subparagraph shall have another subsection, paragraph, and subparagraph at that same level. For example, if the document has a 3.2.1 it shall have a 3.2.2.

5.2 *Lists*

5.2.1 *List Placement*

Readability and comprehension by the reader are the most important factors for presentation of a list. A list with a small number or short items may be better as paragraph, but a long paragraph may be better as a list.

Lists within the body of an existing paragraph shall be preceded by introductory text and a colon. Lists shall not be permitted to be within the middle of a sentence.

The structure of all items within a list shall be parallel, meaning that the items shall be all single words, all phrases, or all full sentences.

In lists consisting of single words and phrases, the introductory text shall include mandatory language that establishes the requirement for the paragraph.

In sentence-style lists, introductory text shall contain mandatory language if each item is not stated as a requirement, and each item shall consist of only one sentence.

Standard Ratings for determining either number of rows, Nr, requirements or sensible capacity, qs, for specific job conditions may be obtained by use of the following data:

1) Performance factors as illustrated in Figure 26
2) For Coils with smooth tubes: f'_{DWL} vs. ReL and jL vs. ReL (Figure 13)
3) For Coils with Turbulators or Internally Grooved Tubes: f'_{DWL} vs. ReL and jL vs. ReL per Section 5.5 (Form 410-7, and Figure 13)
4) Applicable heat transfer Equations in Section 6.2.3
5) Manufacturer established single-phase liquid pressure drop of tubeside coil attachments ($\Delta p_{L\ ATT}$)

List format may not be the best choice. For example, when items in a list consist of very long sentences (more than two lines), and the list itself does not require any typographic prominence, the items may be formatted as regular paragraphs or subparagraphs of text, under appropriate heading number as described in Section 5.1.1.

5.2.2 *Vertical List Punctuated as a Sentence*

Following *Chicago Manual of Style 18th Edition* Section 6.131, if items in a vertical list complete a sentence begun in the introductory text, semicolons or commas can be used between line items, and a period shall follow the final item. If the items include internal punctuation, semicolons shall be used. Each item begins with a lowercased letter, even if the lists is a numbered list. The conjunction "and" or "or" shall be used before the last item.

5.2.3 *Use of Ordered vs Unordered Lists*

Use of an ordered (numbered) list indicates that the items are performed in ordered steps, or that items follow a precedence. An unordered (bullet) list implies that all items in the list are of the same precedence or can be performed in any order.

In cases when a particular item may need to be referred to a numbered list should be used so that the reader can be referred to for example, "4.3.2 (1)" rather than to an unnumbered item for example, "the third item in the list under Section 4.3.2".

Subsection numbers shall not be used for list items, as sections each need a title.

5.2.4 *Style of List items*

The language of items within a list shall be parallel — that is, the items shall all be single words, all phrases, or all full sentences; and all introduced by a noun or all by a verb.

In lists of items consisting of single words and phrases, the introductory text shall include mandatory language that establishes the requirement for the paragraph.

In sentence-style lists, introductory text shall contain mandatory language if each item is not stated as a requirement. In sentence-style lists, each item shall consist of only one sentence.

5.2.5 *Numbering*

Main lists shall be a grouping of listed items within a numbered or lettered section.

Sublists shall be a grouping of listed items within a main list item.

Sub-sublist shall be a grouping of listed items within a sublist item. A third level of a sublist is allowed but discouraged.

The hierarchy for numbering and lettering listed items shall be as follows:

1) Main list item
   a) Sublist item
   b) Sublist item
      i) Sub-sublist item
      ii) Sub-sublist item
2) Main list item

5.3 *Figures*

All figures shall be numbered sequentially throughout the body of the document (Figure 1, Figure 2, Figure 3…) and referenced within the appropriate section, subsection, or paragraph of text. Figures in appendices shall not include the appendix number (Figure 1, Figure 2, Figure 3…)

Figures in the main text of the document shall portray mandatory requirements. Figures in normative sections are normative unless otherwise specified as informative in the title of the figure.

Drawings, charts, or graphs used to illustrate an example or a common situation and not a mandatory requirement shall be placed in an informative appendix.

5.3.1 *Preparation*

Drawings, charts, and graphs shall be prepared by AHRI staff or contractors from drawings submitted by the technical committee.

5.3.2 *Identification*

Each drawing, chart, or graph shall be identified by a figure number and a unique caption.

All figures shall be referenced in the text.

The caption of the figure shall appear below the figure. See example of figure below:

The quantities $\dot{q}(t_j)$ and $E(t_j)$ are calculated for each individual Temperature Bin using the appropriate formula for each bin depending on the operating characteristics of the system. When the building load is less than low stage capacity use Section 11.2.1.2.1. When the building load is greater than the low stage capacity, but less than the high stage capacity, either Section 11.2.1.2.2 or is used, depending on the operating characteristics of the system. See Figure 3 for a graphical representation.

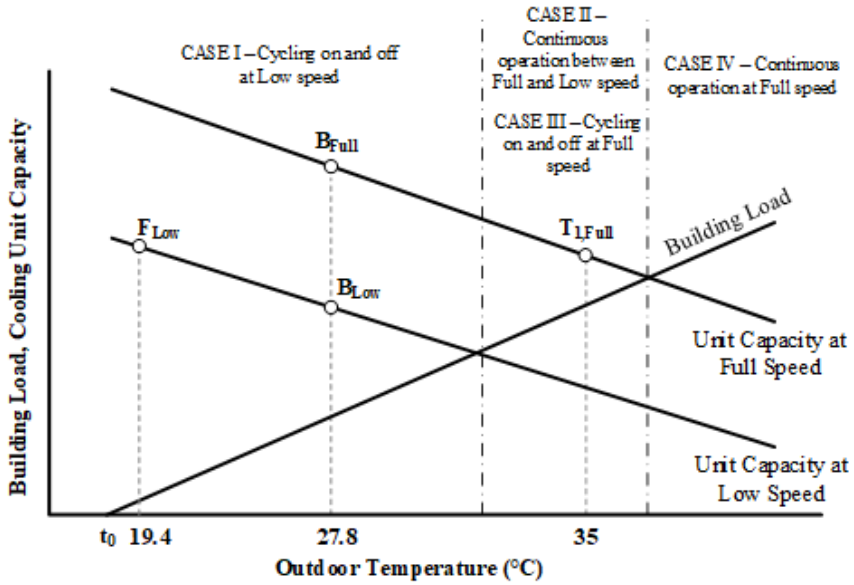


Figure 3 Two-speed System Operation in the Cooling Mode – T1 Climate

5.3.3 *Figure Position in Text*

When used in the text, a figure shall be centered and placed as close to the first reference in the text as convenient.

5.3.4 *Figure Titles*

Figure titles shall be textual elements, rather than part of the figure's graphic file.

All significant elements in a figure shall be labeled with terminology that matches the text discussion. See Section 5.3

Figure titles shall appear centered below the figure.

Units of measure used in figure labels shall be abbreviated.

Symbols in complex figures shall be identified in a legend or note.

Photos and artwork obtained from outside sources shall be identified by a credit line in parentheses following the caption.

5.4 *Tables*

All tables shall be numbered sequentially throughout the body of the body and appendices document (Table 1, Table 2, Table 3…) and referenced within the appropriate section, subsection, or paragraph of text.

5.4.1 *Table Title*

Each table shall be identified by a consecutive number and a unique title. All tables shall be referenced in the text.

Table titles shall appear centered at the top of the table.

The first letter of each word in a table title shall be capitalized.

In a table title, a preposition of four letters or less, an article, or a coordinating conjunction shall be lowercased unless it is the first word.

Each table shall have a unique title.

5.4.2 *Column Headings*

The first letter of each word in a column heading shall be capitalized.

In a column heading, a preposition of four letters or less, an article, or a coordinating conjunction shall be lowercased unless it is the first word.

Abbreviated units of measure in column headings shall be lowercased and enclosed in parentheses, unless the units of measure appear under a rule, then the abbreviated units shall be lowercased but not enclosed in parentheses.

The first letter of every word in column sub-headings shall be capitalized except for any dimensional heading at the top of each column.

5.4.3 *Column Entries*

Only the first letter of the first word of individual table entries shall be capitalized.

5.4.4 *Abbreviations and Letter Symbols*

Abbreviations and letter symbols for units, when the intent and meaning are clear, shall be permitted to be used in headings and in the body of the table.

5.4.5 *Units of Measure*

Units of measure shall be given in the title, column headings, or table footnote as needed.

When the same unit of measure is used throughout a column, the unit of measure shall be given in the column heading instead of the column itself.

When a column contains more than one unit of measure, then the units of measure shall be used in the column and not in the column heading.

Units of measure shall be abbreviated in tables.

5.4.6 *Empty Cells*

An em dash (—) shall be used to indicate an empty cell.

5.4.7 *Numerical Columns*

Tabular material should be centered in each column for columns with inclusive numbers and entries in mixed word/number columns.

All numbers should be aligned on the decimal point, and zeroes shall be placed before the decimal point in numbers less than one.

Decimal indications should be used in tabular work unless fractions are commonly used in the field.

5.4.8 *Textual Columns*

Textual columns (meaning., columns where only words appear) shall be aligned on the left.

Runover lines shall be indented under the first line.

All entries of a reading column shall be grammatically parallel.

A concluding period shall not be used unless the entry is one or more complete sentences.

5.4.9 *Breaking*

Tables should fit vertically on a page, but landscape orientation is allowed if necessary.

When a table carries over for more than one page, the heading shall repeat on successive pages, and column headings shall be repeated on each page.

5.4.10 *Table Notes*

Table notes are informative and may be used for explanation of information found in a table. Table notes shall appear directly beneath the table and not at the foot of the page.

Table note(s) shall be indicated using the word “Note(s)” followed by consecutively numbered text notes.

Table notes shall be included in the last/bottom cell of a table. Table notes that are extensive shall appear below the table in the body of the document indented to the same width as the table. See the example of a table with notes inside a table cell below.

Table 3 Part-load Conditions for Rating

	IPLV.IP	NPLV.IP
Evaporator		
All loads T_{out}, °F [2]	44.00	Selected T_{out}
Flow Rate, gpm/ton$_R$ [3]	Per Table 1	Per Table 1[3]
$R_{fouling}$, h·ft^2·°F/Btu	0.000100	As specified
Water-cooled Condenser [1,2]		
100% load T_{in}, °F	85.00	Selected T_{in}
75% load T_{in}, °F	75.00	Note 4
50% load T_{in}, °F	70.00	Note 4
25% load T_{in}, °F	70.00	Note 4
Flow rate, gpm/ton$_R$ [3]	Note 3	Selected flow rate
$R_{fouling}$, h·ft^2·°F/Btu	0.000250	As specified

Notes:
1. If the unit manufacturer's recommended minimum temperatures are greater than those specified in Table 3, then those can be used instead of the specified temperatures.
2. Correct for Fouling Factor Allowance by using the calculation method described in ANSI/ASHRAE Standard 182-2019.
3. The flow rates are to be held constant at full-load values for all part-load conditions as per Table 1.
4. For part-load entering Condenser water temperatures, the temperature should vary linearly from the selected T_{in} at 100% load to 70.00 °F at 50% loads and fixed at 70.00 °F for 50% to 0% loads.

Table notes applying to the entire table, notes shall appear as bulleted items preceding the numbered notes. See the example of a table with numbers and bullet notes outside of table cell below:

Table 3 Example Table with Different Notes

	Example Category A	**Example Category B**
Example Type 1	ABC1	XYZ1
Example Type 2 [1,2]	Note 3	XYZ2
Example Type 3	ABC3	XYZ3
Example Type 4	ABC4	XYZ4
Example Type 5	ABC5	XYZ5[4]
Example Type 6	ABC6	XYZ6
Example Type 7	ABC7	XYZ7
Example Type 8	ABC8	XYZ8

Notes:
- Example a first note that applies to entire table
- Example a second note that applies to entire table

1. Example note that applies to Note 1 (superscript) in the table.
2. Example note that applies to Note 2 (superscript) in the table.
3. Example note that applies to Note 3 in the table.
4. Example note that applies to Note 4 (superscript) in the table.

5.5 *Equations*

Equations shall be numbered sequentially throughout the body and appendices of the document (1, 2, 3…) and referenced within the appropriate section, subsection, or paragraph of text.

Equation numbers shall be formatted to bold, appear to the right of the equation and align with the right margin. Equations should align with the paragraph above unless an equation needs to be out-dented to prevent line-wrapping. The "Where" statement and variables shall be indented once.

5.2.3 *Calculation of FEC*

The FEC shall be measured data for all fan motors or calculated data using the motor efficiency. See Equation 3:

$$FEC = (P_f \cdot t_f) / (1000) \quad \textbf{3}$$

Where:

P_f = $(P_{fi} \cdot n)$ (measured)

P_f = $(P_{fo} \cdot n) / (hm)$ (calculated)

Equations do not have titles, and do not appear in the Table of Contents.

Constants and variables shall be defined in the section of the text where the equation appears, but not more than once in a subsection.

Informative explanatory information, including how an equation is derived, shall be in an appendix.

An informative example of the equation, with example numbers replacing constants, can follow the equation. The example must be identified as informative, with a reference to the base equation and an explanation of what the equation is demonstrating. While the base equation is numbered, the example is not.

Once the degradation factor is calculated the rating point EER can be calculated using Equation 3 for the rating point C.

$$EER = \frac{LF \cdot Q}{LF \cdot [C_D \cdot (P_C + P_{CD})] + P_{IF} + P_{CT}} = \frac{0.938 \cdot 45{,}394}{0.744 \cdot [1.033 \cdot (2{,}835 + 450)] + 560 + 100} = 10.6 \text{ (Btu/h)/W}$$

Similar degradation corrections are also made for the 25 Percent Load points.

Informative explanatory information, including how an equation is derived, should be in an appendix.

Pursuant to Section 12.45 of the *Chicago Style Manual 17th edition*, fractions shall be set in text with a slash to separate the numerator and the denominator: 1/2, 2/3, 1/10, 97/100. Common numerical fractions may be set as case fractions (text-sized fractions with a horizontal bar):

$\frac{1}{2}, \frac{2}{3}, \frac{1}{10}$

5.6 *Explanatory Information (Notes)*

Notes are used for giving additional information intended to assist the understanding or use of the text of the document. The document shall be usable without the notes. Notes are informative.

Example of Note:

Note: For the purpose of this standard, the terms “equipment” and “systems” are used throughout to mean Multi-split Air-conditions or Multi-split Heat Pumps, or both unless otherwise specified.

5.7 *Cross-References*

5.7.1 *Cross-References to Other Sections*

Cross-references to other sections within the document shall be specific and relevant and shall be placed where relevant in the paragraph.

A cross-reference to a section or appendix shall include the word “Section” in the text.

In the case of a Modulating Compressor, the Published Rating is a set of Individual Published Ratings at unique Steps. The number of unique Steps to comprise each set of Published Ratings is specified in Section 5.3.

6.4 *Ratings*

Standard Ratings for capacity, EER2, SEER2, HSPF2 or $P_{w,OFF}$ shall be based either on test data or computer simulation. For three-phase systems refer to Appendix G.

A cross-reference shall not be required to include “of this standard.”

A cross-reference to a subdivision within a section shall be referred to by number only, without the word subsection or paragraph, except when the cross-reference begins the sentence.

5.7.2 *Cross-References to Figures and Tables*

Cross-references to figures and tables shall be made using the applicable number prefaced by the word Figure or Table.

> The operation of units with single capacity compressors is illustrated in Figure 1. The Total Walk-in System Heat Loads…

When cross-reference is made to two or more figures or tables, the word Figure or Table shall be repeated before each number (for example, Table 4 and Table 5).

When cross-reference is made to a range of figures or tables, the word Figure or Table shall be repeated before each number in the range (for example, Figure 4 through Figure 8).

5.7.3 *Unneeded Cross-References*

Cross-references shall not be used where additional words can serve the same purpose.

5.8 *References to Other Documents and Sources*

A normative reference makes a reference to another document, for example, "see Table 7 of ASHRAE 5432-2015." This reference is comparable to a hyperlink on a web page; content is referred to but not included.

When referring to a standard as a whole, include only the organization and document number, assuming the latest edition of document. When referring to a specific figure, table or text that can change, include document number, year, or edition, or both. In all cases, the full citation of the document shall be added to Appendix A or Appendix B. If a reference appears in a normative section of a standard, the full citation appears in Appendix A. If a reference appears in an informative section of a standard, the full citation shall appear in Appendix B. For this type of reference to be useful the referenced content should be accessible to the reader of the standard.

If the content of the target document is not conveniently accessible, for example, if a copy of the standard must be purchased, the committee can decide to copy the content into the standard; this requires written permission from the content owner. See Section 6.1. The committee is responsible to confirm that the copied content remains applicable, current, and valid, and updates the included text in future revisions of the standard.

The following rules shall apply to references to publications in the text of a document:

1) References to publications in the text shall be for the purpose of supplementing requirements, recommendations, and guidance (as in guides).
2) In codes and standards, only mandatory references shall appear in the text of the document.
3) Bibliographical and informative references shall not be included in the text of a document but only in explanatory material, such as in an appendix.

5.8.1 *References to Books, Reports, and Articles in Periodicals*

All references to books shall be made using the author-date method of citation (for example, the author's last name, or publishing organization if an author is not given, and the year of publication enclosed in parentheses at the end of a sentence).

5.8.2 *Reference Lists in Appendices*

References shall be listed alphabetically and shall include the location of the organizations cited. References to other standards and guidelines shall include the specific date or edition of the document.

5.8.3 *Printed Material (Including Standards, Books, and Journals)*

The style for citations of books, reports, and periodicals shall conform to *The Chicago Manual of Style, 17th edition.*

Style manuals do not mention how to cite standards consistently, but standards should be treated to the same as a book, journal, or book series depending on the situation. *Chicago Manual of Style* Section 14:249 (on "Pamphlets and the Like") states that "[d]ata on author and publisher may not fit the pattern, but necessary information should be given to identify the document." If a standard is published within a journal or other book series, cite the standard the same as a journal article or a book chapter.

Provide enough information so that anyone interested in further information can track down the original document. Citations should indicate that a standard is being referenced, the issuing agency (or publication name), standard number, and standard title (at a minimum). A publication date is needed if it is not obvious from the standard number.

A specific standard can be reprinted, altered, or reissued by different standards organizations. The specific version used shall be cited. For example, API Standard 2543 was issued as ANSI Z11.172-1965 and ASTM D1086-1964. Different versions retain the original pagination and others have completely different pagination. When quoting from a page in the standard the only way for someone to find that specific quoted data is with the version of the standard used.

See examples of printed materials formatted and listed in order below:

AHRI Standard 110-2002, *Air-Conditioning and Refrigerating Equipment Nameplate Voltages*, 2002, Air-Conditioning, Heating and Refrigeration Institute, 2311 Wilson Blvd., Suite 400, Arlington, VA 22203, U.S.A.

ASHRAE Handbook of Refrigeration, Chapter 49, Codes and Standards, 2006, ASHRAE, 180 Technology Parkway NW, Peachtree Corners, Georgia 30092, U.S.A.

Palmatier, E.P. *Construction of the Normal Temperature ASHRAE Psychrometric Chart, ASHRAE Journal*, Vol. 5, 2001, pp 55, ASHRAE, 180 Technology Parkway NW, Peachtree Corners, Georgia 30092, U.S.A.

5.8.4 *Web Pages and Websites*

The style for citations of web pages, and websites shall conform to Section 14.207 (on "Citing web pages and websites") of *The Chicago Manual of Style, 17th edition*. To cite original website content, include as much of the following as can be determined:

- title or description of the specific page
- title or description of the site as a whole
- owner or sponsor of the site
- publication date or date of revision or modification (if no such date can be determined, include an access date)
- URL

The word *website* (or *web page*) may be added (in parentheses) after the title or description of the site if the nature of the source may be otherwise unclear. The access date shall be prior to the ballot for public review. Such dates, together with the URL, give the reader the ability to find the information through the internet archive or other means. At the same time, authors should retain a copy of any source that can change or disappear.

Example reference of a website:

"Privacy Policy," Privacy & Terms, Google, last modified July 1, 2021, https://www.google.com/policies/privacy/.

If a site ceases to exist before publication, or if the information cited is modified or deleted, this information should be included in the text or the note.

Example reference of a website without a published or revision date, using an access date instead:

ASHRAE Terminology. ASHRAE. Accessed [Month Day, Year]. https://www.ashrae.org/technical-resources/free-resources/ashrae-terminology.

5.9 *Letter Symbols and Variables*

Where applicable, the appropriate symbols from ANSI Y10, *American National Standards Institute Series on Letter Symbols*, shall be used.

Letter symbols and variables shall be printed in italics. When subscript or superscript, a letter symbol or variable shall be italicized.

The intent of the subscripts shall be made clear in a "where" list.

Sub- and superscripts consisting of numbers or mathematical functions shall be roman.

To express angle dimensions, the degree symbol preceded by a number shall be permitted to be used.

To express temperature on the temperature scales C, F, and R, the degree symbol shall be used with the appropriate letter symbol (for example, 69°C is the correct abbreviation for 69 degrees Celsius). The degree symbol shall not be required for absolute temperature scale of kelvin (K).

Section 6. Copyright and Permissions

6.1 *Copyright Law*

Copyright is the right and ability of the owner to prevent others from copying a work; this is defined by the Copyright Act of 1976. Unauthorized use by third party of any exclusive rights of copyright holder, meaning copying, is copyright infringement. A court may issue an injunction, award actual and statutory damages.

Standards created by AHRI as well as other organizations are protected by copyright. Written permission is required in order to make or distribute copies, or to include copyrighted content in our standards. This applies to other publications such as web pages, reports, and presentations. Copyright permission may require a license fee.

Distributing copies of a copyrighted work, even for research or FYI purposes, is NOT allowed. "Fair use" does not cover the inclusion of copyrighted content in AHRI publications.

Copyrighted work or their copies, shall NOT be placed on a server or for example, AHRI Connect for members of a committee to access.

If a committee needs to consult content owned by another organization, the EA should arrange for one of the following:

1) Purchase enough copies of the document for all members of the committee.
2) Find one member of the committee who owns a legal copy and appoint that person to research and "speak for" the contents of the document.
3) Get written permission from the copyright holder to distribute copies. See Section 6.2.

6.2 *Permission for Use*

AHRI must have written permission from the owner of content before including content from another organization's documents in AHRI publications, or for distributing copies of a document to members of a committee.

Content shall be correctly attributed with regard to source document and ownership, together with a statement that AHRI has permission to reproduce the content. A credit line within the text and a reference citation in the appropriate appendix shall be provided to acknowledge the owner/copyright holder of the material.

The AHRI staff liaison shall be responsible for obtaining written permission for use of materials from other organizations. When asking the owner of the document/content for written permission, be specific and list exactly the documents that are intended for distribution and to whom the document/content shall be distributed or indicate the tables, figures, and clauses that are to be copied into a specific document.

The committee should maintain the incorporated content by checking for revisions by the content's owner whenever the AHRI standard is updated.

Section 7. Units of Measure in AHRI Standards and Guidelines

7.1 *Units of Measure in AHRI Standards*

All AHRI publications shall be based on hard, rational SI units of measure. Publications with I-P units of measure should be developed based on market need. All AHRI publications shall follow one of Single SI, Dual, or Joint for the use of units of measure. The selected method shall be specified in the project charter of the publication. See the *AHRI Standards Policy and Procedure* document Section 3.3.

7.1.1 *Single SI*

Publish a document that uses SI units of measure only. There is not a companion publication that uses I-P units of measure.

7.1.2 *Dual*

Publish two separate documents that use a substitution as described in Section 7.2.1 to go between a document that uses SI units of measure and one that uses I-P units of measure. The content of the two publications shall be equivalent. Differences between the two documents, other than differences between the units of measure, shall be noted.

7.1.3 *Joint*

Publish a single document using both SI and I-P units of measure. A conversion of SI units of measure to I-P units of measure shall be conducted as specified in Section 7.2.2.

7.2 *Unit Conversions*

One of the following shall be used when selecting the values to publish in I-P units of measure.

7.2.1 *Substitution*

A substitution is an approximate replacement from one set of units to another that uses rational, whole numbers in both sets of units. Use the original value as a guide in selecting a logical value in the alternative units. Hard conversion measurement values are not equal between units of measure.

Examples of substitution:

replacing 100 yards with 100 meters, or three feet with one meter.

replacing 70°F with 20°C

7.2.2 *Conversion*

A conversion is an exact conversion from one set of units to another by multiplying the original value by a factor and then rounding so that the new value implies the same accuracy as the original value. The same number of significant figures shall be used with both sets of units.

Examples of conversion:

replacing 100.0 meters with 109.4 yards

replacing 22.0°C with 71.6°F

Section 8. Interpretations

8.1 *Interpretations Format and Numbering*

Interpretations shall be titled: “Interpretation to [Standard number-year (units)] – [number].”

Interpretations shall be numbered based on the order received.

The next line shall be followed by the title of the standard, and the date the interpretation was approved below.

The body of the interpretation shall include the question, reference, and answer.

Consistent with AHRI standards and guidelines, interpretations shall not reference AHRI Certification programs.

See an example of the interpretation format below:

INTERPRETATION TO AHRI STANDARDS 550/590 – 2020 (I-P) AND 551/591 – 2020 (SI) – 1

PERFORMANCE RATING OF WATER-CHILLING AND HEAT PUMP WATER-HEATING PACKAGES USING THE VAPOR COMPRESSION CYCLE

Date Approved: July 13, 2021

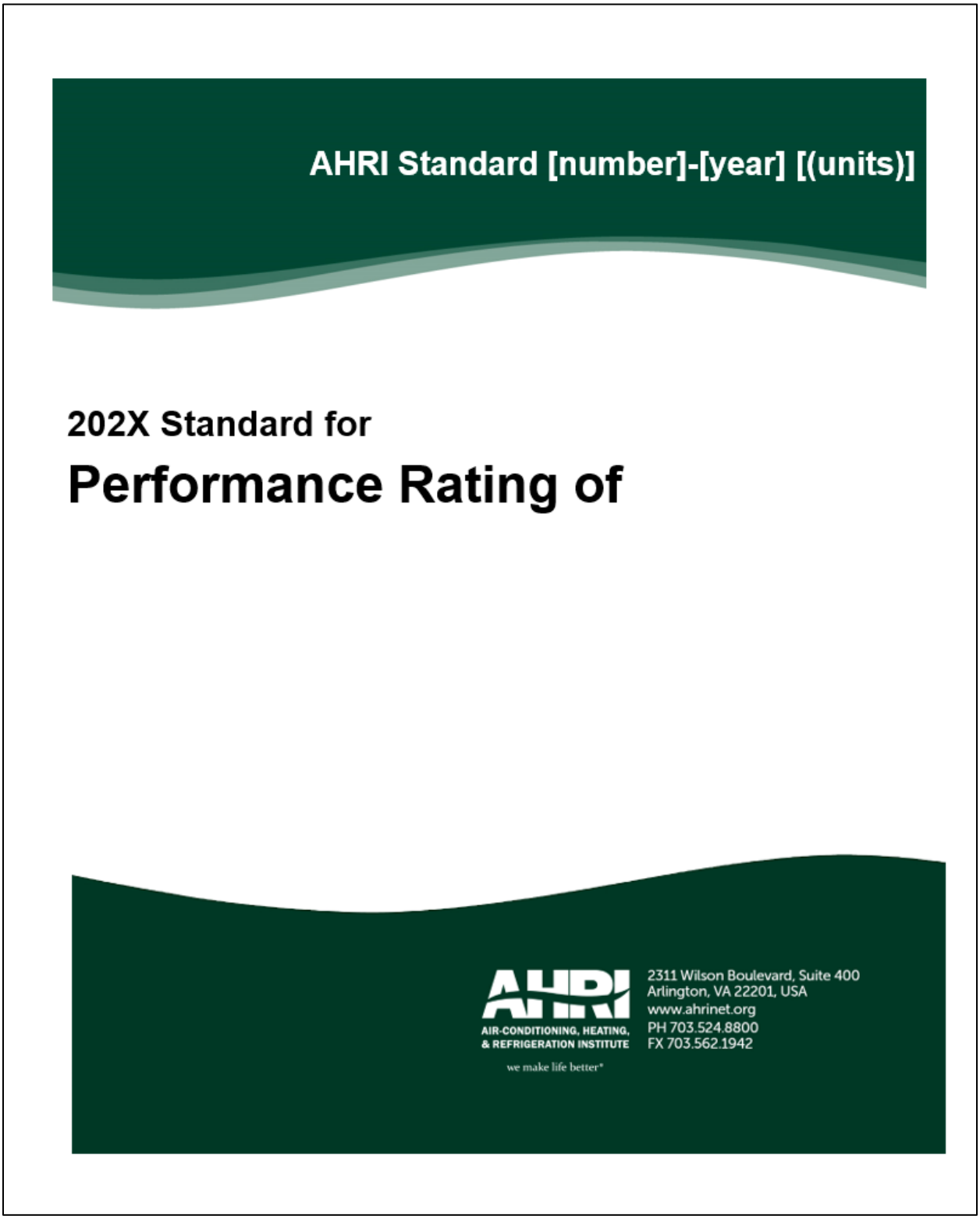
Question: Are refrigerant tubing lengths to be expressed in linear or equivalent units?

References: Table 8 Published Values, and Section 5.9 Refrigerant Tubing for Remote Condenser and Evaporator

Answer: Refrigerant tubing lengths shall be expressed in equivalent lengths. Equivalent lengths shall be calculated per the 2018 ASHRAE Refrigeration Handbook, Chapter 1, Table 16.

APPENDIX A. FRONT MATTER EXAMPLES

Example AHRI Cover page and Front Matter



IMPORTANT
SAFETY DISCLAIMER

AHRI does not set safety standards and does not certify or guarantee the safety of any products, components or systems designed, tested, rated, installed or operated in accordance with this standard/guideline. It is strongly recommended that products be designed, constructed, assembled, installed and operated in accordance with nationally recognized safety standards and code requirements appropriate for products covered by this standard/guideline.

AHRI uses its best efforts to develop standards/guidelines employing state-of-the-art and accepted industry practices. AHRI does not certify or guarantee that any tests conducted under its standards/guidelines will be non-hazardous or free from risk.

Note:

This is a new [standard/guideline]; a prior version does not exist.

This standard supersedes AHRI [number]-[year] [(units)].,

This [standard/guideline] was reaffirmed on [Day Month Year].,

This [standard/guideline] was withdrawn on [Day Month, Year].

For [units] ratings see AHRI [Standard/Guideline] [number]-[year] [(units)]

AHRI CERTIFICATION PROGRAM DISCLAIMER

AHRI Standards are developed independently of AHRI Certification activities and can have scopes that include products that are not part of the AHRI Certification Program. The scope of the applicable AHRI Certification Program can be found on AHRI's website at www.ahrinet.org.

Intent

This standard is intended for the guidance of the industry, including manufacturers, engineers, installers, contractors, and users.

Review and Amendment

This standard is subject to review and amendment as technology advances.

202X Edition

This edition of AHRI Standard [number-year (units)], Performance Rating of XXXX was prepared by the XXXX Standards Working Group / XXXX Standards Technical Committee. It was approved by the XXX Standards Subcommittee on Day Month Year, [with an effective date of Day Month Year].

Origin and Development of AHRI [number]

In 2005 the XXX Product Section identified the need for XXXXX and developed the first edition to providing a new definition of XXX

In 2010 the standard was reaffirmed.

In 2015 an appendix was adopted to provide guidance to the AHRI Committees, regulatory officials, and others that addressed XXXX.

In 2020 the standard was extensively rewritten to introduce nomenclature related to XXXX.

Summary of Changes

AHRI Standard [number-year (units)] contains the following updates to the previous edition:

- XXXX language has been consolidated into one central section
- Definitions have been expanded to include XXXX and XXXX
- Language has been added to provide XXXX
- Additional language has been added to clarify XXXX requirements
- Additional procedures have been added to Appendix X and Appendix X
- New provisions have been added for testing XXXX
- Operating conditions have been harmonized with AHRI XXXX and now include XXXX.

Committee Personnel

[Name] Standards [Working Group / Standards Technical Committee / Standards Subcommittee] for AHRI Standard [number-year (units)]			
Participant	**Interest Category Classification**	**Role**	**State / Country**
[Name] [Organization / Company]	[Category]	Chair	PA
[Name] [Organization / Company]	[Category]	Vice Chair	OH
[Name] [Organization / Company]	[Category]	[Primary / Alternate to XXX]	Washington, D.C.
[Name] [Organization / Company]	[Category]	[Primary / Alternate to XXX]	Canada
[Name] [Organization / Company]	[Category]	[Primary / Alternate to XXX]	UT
[Name of AHRI EA]	AHRI Staff Liaison		

[Name] Standards Technical Committee for AHRI Standard [number-year (units)]			
Participant	**Interest Category Classification**	**Role**	**State / Country**
[Name] [Organization / Company]	[Category]	Chair	PA
[Name] [Organization / Company]	[Category]	Vice Chair	OH
[Name] [Organization / Company]	[Category]	[Primary / Alternate to XXX]	Washington, D.C.
[Name] [Organization / Company]	[Category]	[Primary / Alternate to XXX]	Canada
[Name] [Organization / Company]	[Category]	[Primary / Alternate to XXX]	UT
[Name of AHRI EA]	AHRI Staff Liaison		

[Name] Standards Subcommittee for AHRI Standard [number-year (units)]			
Participant	**Interest Category Classification**	**Role**	**State / Country**
[Name] [Organization / Company]	[Category]	Chair	PA
[Name] [Organization / Company]	[Category]	Vice Chair	OH
[Name] [Organization / Company]	[Category]	[Primary / Alternate to XXX]	Washington, D.C.
[Name] [Organization / Company]	[Category]	[Primary / Alternate to XXX]	Canada
[Name] [Organization / Company]	[Category]	[Primary / Alternate to XXX]	UT
[Name of AHRI EA]	AHRI Staff Liaison		

These lists represent the membership at the time the Standards Technical Committee and Standards Subcommittee were balloted on the final text of this edition. Since that time, changes in the membership may have occurred. Membership on these committees shall not in and of itself constitute an endorsement by the committee members', employers of AHRI, or any document developed by the committee on which the member serves.

[Name] Standards Technical Committee Scope: This committee shall have responsibility for ….

APPENDIX B. APPENDICES EXAMPLES

B.1. Example Appendix A. References - Normative

APPENDIX A. REFERENCES – NORMATIVE

Listed here are all standards, handbooks, and other publications essential to the formation and implementation of the standard. All references in this appendix are considered as part of the standard.

A.1. ANSI/AHRI Standard 110-2012, *Air-Conditioning, Heating, and Refrigerating Equipment Nameplate Voltages*, 2012, Air-Conditioning, Heating and Refrigeration Institute, 2311 Wilson Blvd, Suite 400, Arlington, VA 22201, U.S.A.

A.2. ANSI/AHRI Standard 210/240-2017 with Addendum 1, *Unitary Air-Conditioning and Air-Source Heat Pump Equipment*, 2019, Air-Conditioning, Heating and Refrigeration Institute, 2311 Wilson Blvd, Suite 400, Arlington, VA 22201, U.S.A.

A.3. ANSI/AHRI Standard 310/380-2017 (CSA-C744-17), *Standard for Packaged Terminal Air-Conditioners and Heat Pumps*, 2017, Air-Conditioning, Heating and Refrigeration Institute, 2311 Wilson Blvd, Suite 400, Arlington, VA 22201, U.S.A.

A.4. ANSI/AHRI Standard 340/360-2019, *Commercial and Industrial Unitary Air Conditioning and Heat Pump Equipment*, 2019, Air-Conditioning, Heating and Refrigeration Institute, 2311 Wilson Blvd, Suite 400, Arlington, VA 22201, U.S.A.

A.5. AHRI Standard 390-2021 (I-P), *Performance Rating of Single Package Vertical Air-Conditioners and Heat Pumps*, 2021, Air-Conditioning, Heating and Refrigeration Institute, 2311 Wilson Blvd, Suite 400, Arlington, VA 22201, U.S.A.

A.6. ISO 13256-1, *Water-Source Heat Pumps-Testing and Rating for Performance-Part 1: Water-to-Air and Brine-to-Air Heat Pumps*, 2021, International Organization for Standardization, Case Postale 56, CH-1211, Geneva 20, Switzerland

A.7. ANSI/ASHRAE Standard 146-2011, *Methods of Testing and Rating Pool Heaters*, 2011, ASHRAE, 180 Technology Parkway, Peachtree Corners, GA 30092, U.S.A.

A.8. ASHRAE Terminology. ASHRAE. Accessed October 19, 2021. https://www.ashrae.org/technical-resources/free-resources/ashrae-terminology.

A.9. IEC Standard 60038, *IEC Standard Voltages*, 2002, International Electrotechnical Commission, 3, rue de Varembe, P.O. Box 131, 1211 Geneva 20, Switzerland.

B.2. Example Appendix B. References - Informative

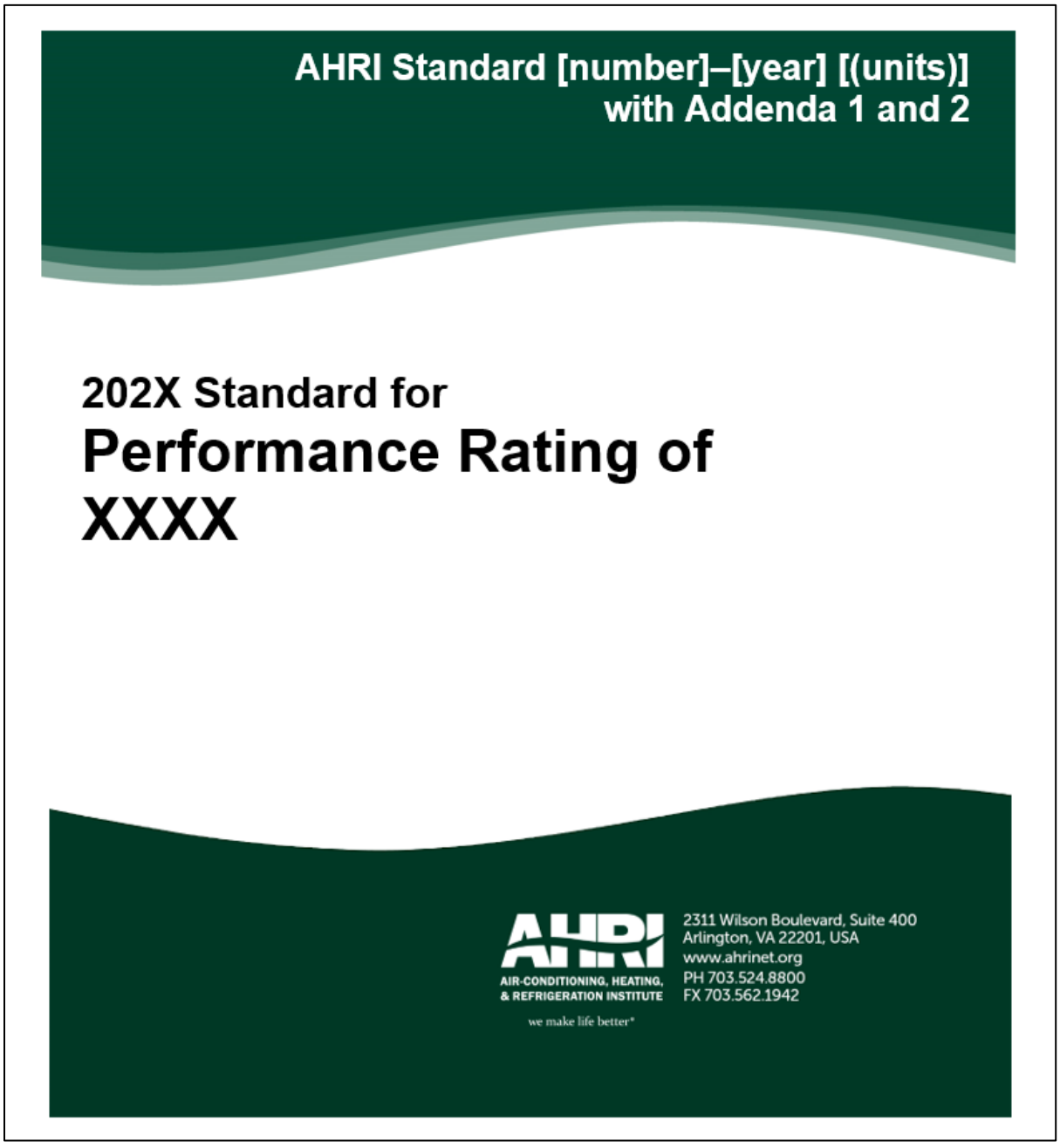
APPENDIX B. REFERENCES - INFORMATIVE

Listed here are standards, handbooks and other publications which may provide useful information and background but are not considered essential. References in this appendix are not considered part of the standard.

B.1. NF Standard 414, *Certification Reference Heat Pump – NF Mark*, 2012, AFNOR Certification 11, rue Francies de Pressense 93571 LA PLAINE ST DENIS Cedex.

APPENDIX C. ADDENDA/ERRATA EXAMPLE

C.1. Example Addenda/Errata Front Cover page and Addenda/Errata pages



we make life better®

AHRI STANDARD [number]-[year] [(units)] (WITH ADDENDA 1 AND 2)

Performance Rating of XXXX

[Month] [Year]

Addendum 2 (dated Month 202x) of AHRI Standard [number]-[year] [(units)], is provided as follows. The following changes have been incorporated (deletions are shown by ~~strikethroughs~~ and additions by shading) into the already published 20XX version of AHRI Standard XXXX to prevent confusion.

1. Revisions to Table X. XXXX in Section X.X XXXX on page X.

Table X. XXXX

D	E	F
DD	EE	FF
DDD	~~NNN~~ EEE	FFF
DDDD	EEE	FFFF

2. Revisions to Equation X in Section X.X.X.X on page XX

Section X.X.X.X. ……

$$EDB = \begin{cases} \frac{3}{2}(T_{100\%} - 55)\left(\%Load - \frac{1}{3}\right) + 55 & \text{for Load } > 100\% \text{ } ~~33.3\%~~/3 \\ 55 & \text{for Load } \leq 100\% \text{ } ~~33.3\%~~/3 \end{cases}$$ [equation number]

we make life better®

AHRI STANDARD [number]-[year] [(units)] (WITH ADDENDUM 1)

Performance Rating of XXXX

[Month] [Year]

Addendum 1 of AHRI Standard XXX-202X, is provided as follows. The following change has been incorporated (deletions are shown by ~~strikethroughs~~ and additions by shading) into the already published 20XX version of AHRI Standard XXXX to prevent confusion.

1. Revisions to Table XX. XXXXXXXXX in Appendix X. XXXXXXXX on page 49.

A	B	C
AA	BB	CC
AAA	~~MMM~~ BBB	CCC
AAAA	BBBB	CCCC