

ASME Y14.41-2019
(Revision of ASME Y14.41-2012)

Digital Product Definition Data Practices

**Engineering Product Definition and
Related Documentation Practices**

AN INTERNATIONAL STANDARD



**The American Society of
Mechanical Engineers**

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**The American Society of
Mechanical Engineers**

Two Park Avenue • New York, NY • 10016 USA

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FOREWORD

The development of this Standard was initiated at the request of industry and the government. A meeting was held to determine the interest in this subject in January 1997 in Wichita, Kansas, hosted by The Boeing Company in their facility. A subsequent meeting was held during the spring ASME meeting in 1997 to enlist membership of those who would be interested in working on this project.

The Chairs of the different Y14 standards continue to collaborate to improve the coordination of the Y14 standards. To this end, in this revision of ASME Y14.41 material regarding surface finish and weld symbols applied to the model has been added. The definitions for classification codes for data sets were developed within Y14.41 to describe the combinations of annotated model and drawing graphic sheets that might be required by a customer. These were given to ASME Y14.100-2013 and placed in Nonmandatory Appendix F. Seeing that most of these classification codes contain model/annotated model, Nonmandatory Appendix F was duplicated and placed here as [Nonmandatory Appendix B](#). At a later date, the classification codes that appear in ASME Y14.100-2017, Appendix F, will be removed and reference to Y14.41.

A clarification of the terms “model” and “annotated model” was added. An example of a uniform tolerance zone is shown and explained. This revision also provides guidance to limit the use of applying GD&M through notes suggesting that the use of annotation will allow for automated tools to construct these design requirements. [Nonmandatory Appendix A, Table A-1](#) was added which contains information whether the requirements defined in this Standard can be accomplished completely by the data preparer or capabilities need to be provided by the software to meet the requirements. These additions allow the reader to find all of the requirements and information within the Standard.

It is essential that this Standard be used in close conjunction with ASME Y14.24, ASME Y14.34, ASME Y14.35, and ASME Y14.100. Although the primary purpose of ASME Y14 series standards is to establish requirements for the preparation and revision of product definition data, this Standard also includes various software-dependent requirements that may not be achievable without computer software tools that have been developed in support of facilitating these requirements. Examples of such requirements include associativity, stationary and rotating annotation planes, display management, attributes available on demand, annotation and annotation plane orientation, query, highlighting, and resolved dimension preservation and association. See [Nonmandatory Appendix A](#) for details.

This Standard is available for public review on a continuing basis. This provides an opportunity for additional public review input from industry, academia, regulatory agencies, and the public-at-large.

This edition was approved as an American National Standard on March 22, 2019.

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Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

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Requests for Cases shall provide a Statement of Need and Background Information. The request should identify the Standard and the paragraph, figure, or table number(s), and be written as a Question and Reply in the same format as existing Cases. Requests for Cases should also indicate the applicable edition(s) of the Standard to which the proposed Case applies.

Attending Committee Meetings. The Y14 Standards Committee regularly holds meetings and/or telephone conferences that are open to the public. Persons wishing to attend any meeting and/or telephone conference should contact the Secretary of the Y14 Standards Committee. Future Committee meeting dates and locations can be found on the Committee Page at <http://go.asme.org/Y14committee>.

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Section 1

General

1.1 SCOPE

This Standard establishes requirements and references documents applicable to the preparation and revision of digital product definition data, hereafter referred to as data sets. This Standard defines exceptions and additional requirements to existing ASME standards for using digital product definition data set(s) or drawing graphic sheet(s) in digital format, hereafter referred to as drawing graphic sheet(s). When no exception or additional requirements are stated, existing ASME standards shall apply. It is essential that this Standard be used in close conjunction with ASME Y14.24, ASME Y14.34, ASME Y14.35, and ASME Y14.100.

1.2 STRUCTURE OF STANDARD

This Standard supports two methods of preparing a data set: annotated model, and an annotated model with a drawing graphic sheet. See [paras. 5.2.1](#) and [5.2.2](#). The structure starts with the requirements common to both methods, and then branches to the other sections that have differing requirements for each method. In addition, it provides a guide for the many Computer-Aided Design (CAD) software packages to develop better modeling and annotation practices for CAD and engineering disciplines.

1.3 ASME Y14 SERIES CONVENTIONS

The conventions in [paras. 1.3.1](#) through [1.3.9](#) are used in this and other ASME Y14 standards.

1.3.1 Mandatory, Recommended, Guidance, and Optional Words

- (a) The word “shall” establishes a requirement.
- (b) The word “will” establishes a declaration of purpose on the part of the design activity.
- (c) The word “should” establishes a recommended practice.
- (d) The word “may” establishes an allowed practice.
- (e) The words “typical,” “example,” “for reference,” or the Latin abbreviation “e.g.” indicate suggestions given for guidance only.

(f) The word “or” used in conjunction with a requirement or a recommended practice indicates that there are two or more options for complying with the stated requirement or practice.

(g) The phrase “unless otherwise specified” or UOS shall be used to indicate a default requirement. The phrase is used when the default is a generally applied requirement and an exception may be provided by another document or requirement.

1.3.2 Cross-Reference of Standards

Cross-reference of standards in text with or without a date following the standard designator shall be interpreted as follows:

(a) Reference to other ASME Y14 standards in the text without a date following the standard designator indicates that the issue of the standard identified in the References section ([Section 2](#)) shall be used to meet the requirement.

(b) Reference to other ASME Y14 standards in the text with a date following the standard designator indicates that only that issue of the standard shall be used to meet the requirement.

1.3.3 Invocation of Referenced Standards

The following examples define the invocation of a standard when specified in the References section ([Section 2](#)) and referenced in the text of this Standard:

(a) When a referenced standard is cited in the text with no limitations to a specific subject or paragraph(s) of the standard, the entire standard is invoked. For example, “Dimensioning and tolerancing shall be in accordance with ASME Y14.5” is invoking the complete standard because the subject of the standard is dimensioning and tolerancing and no specific subject or paragraph(s) within the standard are invoked.

(b) When a referenced standard is cited in the text with limitations to a specific subject or paragraph(s) of the standard, only the paragraph(s) on that subject is invoked. For example, “Assign part or identifying numbers in accordance with ASME Y14.100” is invoking only the paragraph(s) on part or identifying numbers because the subject of the standard is engineering drawing practices and part or identifying numbers is a specific subject within the standard.