

ASME Y14.47-2019

Model Organization Practices

**Engineering Product Definition and
Related Documentation Practices**

AN AMERICAN NATIONAL STANDARD



**The American Society of
Mechanical Engineers**

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**The American Society of
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FOREWORD

The U.S. Department of Defense requested that ASME adapt Appendix B of MIL-STD-31000A, Technical Data Packages (TDP), as a national standard to support broader usage of its concepts. MIL-STD-31000A, Appendix B provides a methodology for organizing the various elements of a product definition data set. The purpose of MIL-STD-31000A, Appendix B is to propose a mechanism for utilizing annotated models in a TDP in a way such that a traditional drawing is not needed.

To address this need for a national standard, the subject of Appendix B, MIL-STD-31000A and the principles defined by the ASME Y14 series of standards formed a basis for the creation of a model organizational schema as outlined in this Standard. The model organizational schema will enable the use of the product definition data by both humans and machines. This capability is also required to support a model-based enterprise (MBE). By supporting an MBE, the product definition data can be readily reused by downstream users throughout the product life cycle.

Future editions of this Standard will refine and expand the schema and expand support for both TDP and MBE.

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 Standard was approved by the American National Standards Institute on January 11, 2019.

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Engineering Product Definition and Related Documentation Practices

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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.

Proposing a Case. Cases may be issued to provide alternative rules when justified, to permit early implementation of an approved revision when the need is urgent, or to provide rules not covered by existing provisions. Cases are effective immediately upon ASME approval and shall be posted on the ASME Committee web page.

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MODEL ORGANIZATION PRACTICES

1 GENERAL

1.1 Scope

This Standard establishes a schema for organizing a three-dimensional (3D) model and other associated information within the context of a digital product definition data set for the purpose of conveying a product definition that enables a model-based enterprise (MBE). This Standard contains no requirements pertaining to drawing graphic sheets. The schema defines a common practice to improve design productivity and to deliver consistent data content and structure to consumers of the data to facilitate common exchange interfaces.

1.2 Introduction

This Standard outlines model organization schema practices to support model-based definition (MBD). This provides a set of requirements and guidelines for the computer-aided design (CAD) user. It is intended to be the foundation for design development efforts in an MBE.

Previously, 3D models had an accompanying drawing graphic sheet. With current advances in CAD capabilities, product definition previously shown on a drawing graphic sheet may be defined and displayed directly in the MBD. This is accomplished by utilizing a combination of annotations and naming conventions to organize the 3D model. This makes the 3D model a master source for obtaining product definition data and eliminates the need for a drawing graphic sheet.

The organization practices defined by this Standard are necessary to establish a common method to facilitate access to the MBD data in the data set. While the focus of this Standard is initially on mechanical items, the intent is to provide a foundation for use in any discipline. The schema are compliant with an annotated model defined in ASME Y14.41.

1.3 ASME Y14 Series Conventions

The conventions in [paras. 1.3.1 through 1.3.10](#) are guidance used in this and other ASME Y14 standards.

1.3.1 Mandatory, Nonmandatory, Guidance, and Optional Words

- (a) The word “shall” establishes a mandatory requirement.
- (b) The word “will” establishes an intended, mandatory requirement.
- (c) The word “should” establishes a recommended practice.
- (d) The word “may” establishes an allowed practice.
- (e) The words “typical,” “example,” and “for reference,” and 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” (UOS) shall be used to indicate a default requirement. This 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 is interpreted as follows:

- (a) Reference to other ASME Y14 standards in the text without a date following the standard designator indicates the edition of the standard as identified in the References ([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 edition 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 2](#)) and referenced in 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 is invoked.