

ASME Y14.45-2021

Measurement Data Reporting

**Engineering Product Definition and
Related Documentation Practices**

AN AMERICAN NATIONAL STANDARD



**The American Society of
Mechanical Engineers**

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FOREWORD

This is the first edition of ASME Y14.45, Measurement Data Reporting. The objective of this Standard is to provide industry with standardized content for dimensional measurement data for size and geometric tolerances defined in ASME Y14.5.

This Standard provides three measurement data reporting methods: method A for attribute data, method B for variable data, and method C for additional informative data. The user may choose from these methods to communicate the requirements for the type of data needed. The user shall specify the required reporting methods in a dimensional measurement plan or other suitable document.

Example data reports are included, but use of the report format or acronyms shown is not mandatory. Example methods of numbering tolerances using characteristic identifiers are provided, but these particular methods are not mandatory.

This Standard provides

- (a)* definitions of measured values for each type of tolerance defined in ASME Y14.5, with exceptions stated
- (b)* information regarding what measurement data to report, and thus inherently what to measure for each type of tolerance
- (c)* requirements for additional feature location information for position and profile tolerances
- (d)* reporting practices needed to address the resolved geometry method and the surface method of tolerances specified at maximum material condition or least material condition

This Standard does not provide information on how to measure a part.

This edition was approved by the American National Standards Institute as an American National Standard on July 6, 2021.

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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.

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.

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Section 1

General

1.1 SCOPE

This Standard establishes uniform practices for reporting attribute or variable measurement data for the dimensioning and tolerancing specifications defined in ASME Y14.5-2018 and actual values defined in ASME Y14.5.1-2019. This Standard may be used with previous versions of ASME Y14.5 where they do not conflict with ASME Y14.5-2018. Measurement data used in support of product acceptance, manufacturing process evaluation, design development, and other uses is addressed. All reporting requirements are independent of the measurement process or equipment used to gather the data.

1.2 STRUCTURE OF THE STANDARD

Sections 1 through 3 include the scope, references, and definitions. Section 4 includes general information on measurement data and measurement data reporting methods. Sections 5 through 10 include specific information on measurement data reporting methods for geometric dimensioning and tolerancing. Section 11 includes measurement data reporting practices for geometric dimensioning and tolerancing applied to patterns of features. Section 12 includes measurement data reporting practices for geometric dimensioning and tolerancing applied to features that are not orthogonal to the datum reference frame. Mandatory Appendix I explains why basic dimensions shall not have characteristic identifiers applied. Nonmandatory Appendix A includes examples of method C data.

In this Standard, the term “actual” is not subject to measurement uncertainty, whereas the term “measured” indicates data that is subject to measurement uncertainty.

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,” 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” or the abbreviation “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-references to other ASME Y14 standards shall be interpreted as follows:

(a) If an in-text cross-reference does not cite the edition year, the edition cited in Section 2 applies to the requirement.

(b) If an in-text cross-reference cites the edition year, only that edition applies to the requirement.

1.3.3 Invocation of Referenced Standards

The following examples define the invocation of a standard when the standard is specified in 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 paragraphs on that subject are 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.