

Dimensioning, Tolerancing, Surface Texture, and Metrology Standards— Rules for Drawings With Incomplete Reference to Applicable Drawing Standard

Product Definition Specifications (PDS)

AN AMERICAN NATIONAL STANDARD



The American Society of
Mechanical Engineers



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Mechanical Engineers**

Two Park Avenue • New York, NY • 10016 USA



Date of Issuance: December 31, 2013

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FOREWORD

Engineering drawings often function as contract documents. This Standard addresses the situation where no standards are listed on an engineering drawing; this may cause contract or legal issues.

When an engineering drawing is produced, regardless of the country it was produced in, it must be based on a set of standards or it is not interpretable. ASME recommends that every drawing should have its applicable standards stated on the drawing, in a document referenced on the drawing, or in contractually imposed documents. The standards may be company, regional, national, or international standards.

Where the applicable engineering drawing standards, surface texture standards, or measurement standards are not indicated by one of these methods, the interpretation of the engineering drawing and the measurement methods are unspecified. Unfortunately, there are many drawings in industry that do not have any indication as to which standards are to be used for interpretation.

The purpose of this Standard is to identify the set of engineering drawing, surface texture, and measurement standards as de facto standards to apply to engineering drawings where no standards are indicated on the drawing, in a document referenced on the drawing, or in contractually imposed documents.

ASME has three committees that produce standards that affect drawing specification, interpretation, and measurement practices. They are as follows:

- (a) B46 Committee on Classification and Designation of Surface Qualities
- (b) B89 Committee on Dimensional Metrology
- (c) Y14 Committee on Engineering Drawing and Related Documentation Practices

These three ASME Standards Committees have jointly prepared and individually approved this Standard to define the applicable dimensioning and tolerancing standards, surface texture standards, and associated measurement standards when no reference is made to a company, regional, national, or international standard on dimensioning and tolerancing on an engineering drawing or model. The Special Committee H213 on Harmonization of Dimensional and Geometrical Product Specifications and Verification was instrumental in initiating this document.

This Standard was approved as an American National Standard on December 20, 2013.



SPECIAL COMMITTEE H213

Harmonization of Dimensional and Geometrical Product Specifications and Verification

(The following is the roster of the Committee at the time of approval of this Standard.)

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General. ASME standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by proposing revisions and attending Committee meetings. Correspondence should be addressed to:

Secretary, H213 Special Committee
The American Society of Mechanical Engineers
Two Park Avenue
New York, NY 10016-5990
<http://go.asme.org/Inquiry>

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 for the purpose of providing 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, 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 H213 Special Committee regularly holds meetings or telephone conferences, which are open to the public. Persons wishing to attend any meeting or telephone conference should contact the Secretary of the H213 Special Committee or check the ASME Web site at <http://cstools.asme.org/>.



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PRODUCT DEFINITION SPECIFICATIONS (PDS)

DIMENSIONING, TOLERANCING, SURFACE TEXTURE, AND METROLOGY STANDARDS — RULES FOR DRAWINGS WITH INCOMPLETE REFERENCE TO APPLICABLE DRAWING STANDARD

1 SCOPE¹

This Standard defines the applicable dimensioning and tolerancing standards, surface texture standards, and associated measurement standards when no reference is made to a company, regional, national, or international standard on dimensioning and tolerancing on a drawing or model. This Standard applies to drawings created in any country. Further use of the term “drawing” in this Standard is intended to include models.

2 PRODUCT DEFINITION SPECIFICATIONS

ASME Product Definition Specifications (PDS) are a set of standards used to document and interpret engineering and verification requirements. PDS standards are jointly developed and approved by the B46, B89, and Y14 committees. PDS standards are harmonized to address engineering and verification requirements. PDS standards may invoke partial or entire ASME B46, B89, and Y14 standards as long as the content is harmonized between engineering and verification requirements.

3 Y14.5 REFERENCE TO STANDARD

Paragraph 1.4 of USASI-1966, para. 5.1.4 of ANSI Y14.5-1973, para. 1.1.2 of ANSI Y14.5M-1982, and para. 1.1.3 of ASME Y14.5M-1994 and ASME Y14.5-2009 state that the relevant standard shall be referenced on the drawing, in a document referenced on the drawing, or contractually imposed documents to avoid misinterpretation. For example, ASME Y14.5-2009, para. 1.1.3 states the following:

1.1.3 Reference to This Standard. Where drawings are based on this Standard, this fact shall be noted on the

¹ See the Foreword for information on the reason for this Standard.

drawings or in a document referenced on the drawings. References to this Standard shall state ASME Y14.5-2009.

4 DRAWINGS WITHOUT REFERENCE TO A STANDARD

When a drawing is produced without a reference to a standard (company, regional, national, or international) or contractually imposed documents and the drawing contains symbology from a USASI, ANSI, or ASME standard on dimensioning and tolerancing, the drawing shall be interpreted according to the latest approved USASI, ANSI, or ASME Y14.5 standard that existed at the date when the drawing was first approved. The relevant dimensioning and tolerancing standard(s) shall be determined by the approval date in the drawing title block. See Table 1 for a list of applicable Y14 dimensioning and tolerancing standards, B46.1 standards, and B89 standards. When the drawing contains no reference to ASME Y14.5, the applicable editions of standards are defined by Table 1.

When a drawing is produced without a reference to a standard (company, regional, national, or international) or contractually imposed documents and the drawing contains symbology that is unique to a specific edition of a standard shown in Table 1, the drawing shall be interpreted according to that edition.

5 ANSI/ASME B46 AND B89 STANDARDS

The reference to a USASI/ANSI/ASME Y14.5 Dimensioning and Tolerancing standard also invokes any applicable ASA/ANSI/ASME B46 standards on Surface Texture and applicable ANSI/ASME B89 standards such as shown in Table 1, unless otherwise specified on the drawing, in a document referenced on the drawing, or in a company measurement plan.



**Table 1 Editions of ASME Y14, ASME B46.1, and
ASME B89 Documents for Drawings Without Reference to a Standard**

	Drawing Standards		Surface Metrology	Measurement Standards		
	Y14.5	Y14.36	B46.1	B89.3.1	B89.7.3.1 [Note (1)]	B89.7.5 [Note (2)]
Year Drawing Was Approved	Dimensioning and Tolerancing	Surface Texture Symbols	Surface Texture – Surface Roughness, Waviness, and Lay	Measurement of Out-of- Roundness	Guidelines for Decision Rules	Metrological Traceability of Dimensional Measurements to the SI Unit of Length
1966–1971	Y14.5-1966	...	B46.1-1962	...	...	...
1972	Y14.5-1966	...	B46.1-1962	B89.3.1-1972	...	...
1973–1977	Y14.5-1973	...	B46.1-1962	B89.3.1-1972	...	...
1978–1981	Y14.5-1973	Y14.36-1978	B46.1-1962	B89.3.1-1972	...	...
1982–1984	Y14.5-1982	Y14.36-1978	B46.1-1978	B89.3.1-1972	...	...
1985–1993	Y14.5-1982	Y14.36-1978	B46.1-1985	B89.3.1-1972	...	...
1994	Y14.5-1994	Y14.36-1978	B46.1-1985	B89.3.1-1972	...	...
1995	Y14.5-1994	Y14.36-1978	B46.1-1995	B89.3.1-1972	...	...
1996–2000	Y14.5-1994	Y14.36M-1996	B46.1-1995	B89.3.1-1972	...	...
2001	Y14.5-1994	Y14.36M-1996	B46.1-1995	B89.3.1-1972	B89.7.3.1-2001	...
2002–2005	Y14.5-1994	Y14.36M-1996	B46.1-2002	B89.3.1-1972	B89.7.3.1-2001	...
2006–2008	Y14.5-1994	Y14.36M-1996	B46.1-2002	B89.3.1-1972	B89.7.3.1-2001	B89.7.5-2006
2009–2013	Y14.5-2009	Y14.36M-1996	B46.1-2002 or 2009	B89.3.1-1972	B89.7.3.1-2001	B89.7.5-2006
2014 up to next edition of Y14.5	Y14.5-2009	Y14.36M-1996 or later edition	B46.1-2002 or later edition	B89.3.1-1972 or later edition	B89.7.3.1-2001 or later edition	B89.7.5-2006 or later edition

GENERAL NOTE: The documents listed in this Table were published by The American Society of Mechanical Engineers (ASME), Two Park Avenue, New York, NY 10016; Order Department: 22 Law Drive, P.O. Box 2900, Fairfield, NJ 07007-2900.

NOTES:

(1) The ASME B89.7.3.1 standard is invoked only if a drawing, created in 2001 or later, includes decision rule terminology and no reference is made to other explanatory information.

(2) The ASME B89.7.5 document is invoked only if a drawing, created in 2006 or later, specifies metrological traceability terminology and no reference is made to other explanatory information.



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