AMERICAN NATIONAL STANDARD

General Tolerances for Metric Dimensioned Products

ANSI B4.3 - 1978

REAFFIRMED 1999

FOR CURRENT COMMITTEE PERSONNEL
PLEASE SEE ASME MANUAL AS-11

REAFFIRMED 2004

FOR CURRENT COMMITTEE PERSONNEL
PLEASE E-MAIL CS@asme.org

SECRETARIAT

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

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THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

United Engineering Center 345 East 47th Street New York, N. Y. 10017

FOREWORD

The American National Standards Committee B4 was reorganized in November 1975 and renamed "Standardization of Allowances and Tolerances for Manufactured Parts". A need for a general tolerancing system similar to, and recommended to be used with, the ANSI B4.2 standard on Preferred Metric Limits and Fits was recognized. The International Standard ISO 2768, Permissible Machining Variations in Dimensions Without Tolerance Indications, was prepared by the Technical Committee ISO/TC3–Limits and Fits, for the above purpose, and it was approved by the U.S.A. and 22 other countries in 1972. It was decided by the B4 Committee that a similar American standard be prepared based on the ISO 2768 standard.

A draft proposal was circulated for letter ballot of the Committee on October 14, 1976. Comments received as a result of this ballot led to changes of the original draft proposal and subsequent approval of the text by the B4 Standards Committee. Final approval for this standard was granted by the American National Standards Institute on 16 March 1978.

AMERICAN NATIONAL STANDARDS COMMITTEE B4

Standardization of Allowances and Tolerances for Manufactured Parts

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AMERICAN NATIONAL STANDARD

GENERAL TOLERANCES FOR METRIC DIMENSIONED PRODUCTS

1 SCOPE

This standard shows how to specify the general tolerances for metric dimensions without tolerance designation.

The fine and medium tolerance series, as shown in Table 1, are mostly applicable to machined parts, and the coarse series show tolerances for use on all types of dimensions.

2 TOLERANCE INDICATION

All drawing dimensions of parts shall be associated with tolerance data. These data may be expressed as follows:

a. As specified limits or a tolerance applied directly to the dimension.

b. As specified in other documents referenced on the drawing.

c. In a general tolerance note referring to all dimensions on a drawing for which tolerances are not otherwise specified.

3 GENERAL TOLERANCE NOTE

Where a general tolerance note is to be used to control dimensions without specified tolerances, one of the following methods is recommended:

3.1 Linear Dimensions

1. Specify a permissible variation equal to ± one half of an International Tolerance (IT) Grade (see American National Standard on Preferred Metric Limits and Fits, B4.2-1978 Appendix B, Table B1) by reference to the IT grade in a tolerance note as follows for tolerance grade IT14:

UNLESS OTHERWISE SPECIFIED ALL UNTOLERANCED DIMENSIONS ARE

$$\pm \frac{IT14}{2}$$

2. Specify one of the three series given in Table 1 as the following examples show for a medium series:

a. With a note:

UNLESS OTHERWISE SPECIFIED, THE GENERAL TOLERANCE SPECIFIED IN ANSI B4.3 MEDIUM SERIES APPLY

b. With a table:

Dimensions in mm

GENERAL TOLERANCE UNLESS OTHERWISE SPECIFIED THE FOLLOWING TOLERANCES ARE APPLICABLE							
LINEAR	OVER	0.5	6	30	120	315	1000
	TO	6	30	120	315	1000	2000
TOL	±	0.1	0.2	0.3	0.5	0.8	1.2

3. Specify general tolerances expressed as a function of the number of digits following the decimal point in the linear dimension such as shown in the example below:

Dimensions in mm

GENERAL TOLERANCE UNLESS OTHERWISE SPECIFIED THE FOLLOWING TOLERANCES ARE APPLICABLE					
LINEAR	OVER	–	120	315	1000
	TO	120	315	1000	–
TOL	ONE DECIMAL ±	0.3	0.5	0.8	1.2
	NO DECIMALS ±	0.8	1.2	2	3

4. Specify a single tolerance value for all untoleranced nominal dimensions by a tolerance note as follows:

UNLESS OTHERWISE SPECIFIED ALL UNTOLERANCED DIMENSIONS ARE ± 0.8 mm.

NOTE

This method is recommended only where the magnitude of the dimensions on the drawing do not vary appreciably.

3.2 Angular Dimensions

The general tolerances for angles are based upon the shorter of the two legs forming the angle, and the numerical values are shown in Table 2. The angular tolerance is given as follows:

a. Either as an angle in decimal degrees or in degrees and minutes

b. Or as a taper expressed in percentage (number of millimeters per 100 mm)

c. Or as a taper expressed in milliradians

The angular general tolerance may be specified on the drawing as follows:

1. UNLESS OTHERWISE SPECIFIED THE GENERAL TOLERANCES IN ANSI B4.3 APPLY

2. The numerical values shown in Table 2 may be added to the drawing format

3. One single value expressed in degrees and minutes such as: 0° 30′

Table 1 General Tolerance — Linear Dimensions

Variations in mm

Basic dimensions mm		0.5 to 3	over 3 to 6	over 6 to 30	over 30 to 120	over 120 to 315	over 315 to 1 000	over 1 000 to 2 000
Permissible variations	Fine series	± 0.05	± 0.05	± 0.1	± 0.15	± 0.2	± 0.3	± 0.5
	Medium series	± 0.1	± 0.1	± 0.2	± 0.3	± 0.5	± 0.8	± 1.2
	Coarse series		± 0.2	± 0.5	± 0.8	± 1.2	± 2	± 3

Table 2 General Tolerance — Angles and Tapers

Length of the shorter leg mm		up to 10	Over 10 to 50	Over 50 to 120	Over 120 to 400
Permissible Variations	in degrees and minutes	± 1°	±0° 30′	±0° 20′	±0° 10′
	in millimeters per 100 mm	± 1.8	± 0.9	± 0.6	± 0.3
	in milliradians	± 18	± 9	± 6	± 3


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