

American National Standard Dimensional Tolerances for Aluminum Mill Products

Secretariat

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Foreword

This Standard is a revision of “American National Standard Dimensional Tolerances for Aluminum Mill Products” issued in 2013 (ANSI H35.2-2013).

The tolerances included in this Standard were developed by the Technical Committee of The Aluminum Association. They are broadly accepted both within the aluminum industry itself and by users of the metal. They are the basis of the dimensional tolerances specified in U.S. government, technical society, and other specifications for aluminum products. They represent the maximum deviation from specified dimensions that may be expected in any individual piece. For most pieces the deviation from specified dimensions will be less than the tolerance shown.

Work on the tolerances began in the Aluminum Association in 1949, five years before its Technical Committee was established. In that year a special committee was appointed by the Association’s Extruded Products Division to develop drafting standards for these products. One of the committee’s assignments was to develop standard tolerances for aluminum extrusions. The committee completed its work later in 1949, and the Association issued the first edition of its *Drafting Standards for Extruded and Tubular Products*, including the tolerances, in October of that year.

By 1954, the Association’s technical activities had grown to the point that a standing Technical Committee was needed. One of the first jobs undertaken by this committee was the compilation of mechanical property data for commonly used aluminum alloys and dimensional tolerances for other aluminum mill products. This work was completed later in 1954, and the resulting data were published in the first edition of the Association’s “Standards for Aluminum Mill Products” in June 1955. Successive editions of the “Standards for Aluminum Mill Products” have been revised to include new data and to keep the manual abreast of industry advances. In 1968 the title was changed to “Aluminum Standards and Data” to reflect the adoption of a revised format.

Many refinements have been made in the tolerances as experience was gained in their use. In addition, tolerances have been developed for products not covered initially, and the data have been extended to embrace the larger sizes now being produced. All of these additions and refinements have been incorporated into this Standard. Included also are definitions of the various products as given in “Aluminum Standards and Data” published by the Aluminum Association, and standard limits for expressing the tolerances.

This Standard was originally developed and subsequently revised using the “canvass” method and published under the proprietary sponsorship of the Aluminum Association. At the request of the Aluminum Association, the establishment of Standards Committee H35 on Aluminum and Aluminum Alloys was authorized by the American National Standards Institute on 17 February 1970, with the Association serving as Secretariat.

The 1971 revision of ANSI H35.2 was the first revision developed by Standards Committee H35, under the “Standards Committee” procedures, and the 1972, 1975, 1978, and 1982 revisions were developed under the auspices of that Committee.

Standards Committee H35 was transferred to an Accredited Standards Committee on December 28, 1983, and this revision was developed under the Accredited Standards Committee method.

This latest (2017) revision consists of updated illustrations, removal of footnote 1, changes to the list of definitions, the addition of the definition of applicable limits, edits to the definition of mean wall thickness, editorial corrections and clarifications to table headings and footnotes. These changes are indicated by highlights in the text.

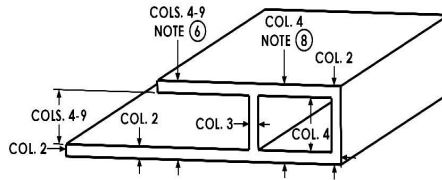
Errata: A typographical error was corrected in Col. 4 of Table 11.2 Cross-Sectional Dimension Tolerances—Profiles. Column 4 heading was changed from “At Dimensioned Points 0.250-**0.642** inches from Base of Leg” to “At Dimensioned Points 0.250-**0.624** inches from Base of Leg.”

11. Wire, Rod, Bar, and Profiles – Extruded

Table 11.1 intentionally blank

TABLE 11.2 Cross-Sectional Dimension Tolerances—Profiles ①

EXCEPT FOR T3510, T4510, T6510, T73510, T76510 AND T8510 TEMPER ⑦



SPECIFIED DIMENSION in.	TOLERANCE ②—in. plus and minus																
	METAL DIMENSIONS				SPACE DIMENSIONS												
	ALLOWABLE DEVIATION FROM SPECIFIED DIMENSION WHERE 75 PERCENT OR MORE OF THE DIMENSION IS METAL ⑨ ⑩				ALLOWABLE DEVIATION FROM SPECIFIED DIMENSION WHERE MORE THAN 25 PERCENT OF THE DIMENSION IS SPACE ⑥ ⑧												
	All Except Those Covered by Column 3		Wall Thickness ④ Completely ⑤ Enclosing Space 0.11 sq. in. and Over (Eccentricity)		At Dimensioned Points 0.250-0.624 inches from Base of Leg		At Dimensioned Points 0.625-1.249 inches from Base of Leg		At Dimensioned Points 1.250-2.499 inches from Base of Leg		At Dimensioned Points 2.500-3.999 inches from Base of Leg		At Dimensioned Points 4.000-5.999 inches from Base of Leg		At Dimensioned Points 6.000-8.000 inches from Base of Leg		
Col. 2		Col. 3		Col. 4		Col. 5		Col. 6		Col. 7		Col. 8		Col. 9			
Standard Tolerance All Except 5XXX Alloys ⑪	Precision Tolerance All Except 5XXX Alloys	Standard Tolerance All Except 5XXX Alloys ⑪	Precision Tolerance All Except 5XXX Alloys	Standard Tolerance All Except 5XXX Alloys ⑪	Precision Tolerance All Except 5XXX Alloys	Standard Tolerance All Except 5XXX Alloys ⑪	Precision Tolerance All Except 5XXX Alloys	Standard Tolerance All Except 5XXX Alloys ⑪	Precision Tolerance All Except 5XXX Alloys	Standard Tolerance All Except 5XXX Alloys ⑪	Precision Tolerance All Except 5XXX Alloys	Standard Tolerance All Except 5XXX Alloys ⑪	Precision Tolerance All Except 5XXX Alloys	Standard Tolerance All Except 5XXX Alloys ⑪	Precision Tolerance All Except 5XXX Alloys		
CIRCUMSCRIBING CIRCLE SIZES LESS THAN 10 INCHES IN DIAMETER																	
Up thru 0.124	0.006	0.004	±10% of specified dimension; ±0.010 min.	±10% of specified dimension; ±0.060 max.	0.010	0.007	0.012	0.008	..	..	..	..	..	..	..	..
0.125-0.249	0.007	0.005			0.012	0.008	0.014	0.009	0.016	0.011	..	..	..	..	..	..	..
0.250-0.499	0.008	0.005			0.014	0.009	0.016	0.011	0.018	0.012	0.020	0.013	..	..	..	..	..
0.500-0.749	0.009	0.006			0.016	0.011	0.018	0.012	0.020	0.013	0.022	0.015	..	..	..	..	..
0.750-0.999	0.010	0.007			0.018	0.012	0.020	0.013	0.022	0.015	0.025	0.017	0.030	0.020	..	..	..
1.000-1.499	0.012	0.008	±10% of specified dimension; ±0.060 max.	±10% of specified dimension; ±0.060 max.	0.021	0.014	0.023	0.015	0.026	0.017	0.030	0.020	0.035	0.023	..	..
1.500-1.999	0.014	0.009			0.024	0.016	0.026	0.017	0.031	0.020	0.036	0.024	0.042	0.028	0.050	0.033	..
2.000-3.999	0.024	0.016			0.034	0.022	0.038	0.025	0.048	0.032	0.057	0.038	0.068	0.045	0.080	0.053	..
4.000-5.999	0.034	0.022			0.044	0.029	0.050	0.033	0.064	0.042	0.078	0.051	0.094	0.062	0.110	0.073	..
6.000-7.999	0.044	0.029			0.054	0.036	0.062	0.041	0.082	0.054	0.099	0.065	0.120	0.079	0.140	0.092	..
8.000-9.999	0.054	0.036			0.064	0.042	0.074	0.049	0.100	0.066	0.120	0.079	0.145	0.096	0.170	0.112	..
CIRCUMSCRIBING CIRCLE SIZES 10 INCHES IN DIAMETER AND OVER																	
Up thru 0.124	0.014	0.009			±15% of specified dimension; ±0.090 max.	±15% of specified dimension; ±0.015 min.	0.018	0.012	0.020	0.013
0.125-0.249	0.015	0.010	0.019	0.013			0.022	0.015	0.028	0.018	..	..	..	..	..	..	..
0.250-0.499	0.016	0.011	0.020	0.013			0.024	0.016	0.030	0.020	0.050	0.033	..	..	..	..	..
0.500-0.749	0.017	0.011	0.022	0.015			0.027	0.018	0.040	0.026	0.060	0.040	..	..	..	..	..
0.750-0.999	0.018	0.012	0.023	0.015			0.030	0.020	0.050	0.033	0.070	0.046	0.090	0.059	..	..	..
1.000-1.499	0.019	0.013	±15% of specified dimension; ±0.090 max.	±15% of specified dimension; ±0.015 min.	0.024	0.016	0.034	0.022	0.060	0.040	0.080	0.053	0.100	0.066	..	..
1.500-1.999	0.024	0.016			0.034	0.022	0.044	0.029	0.070	0.046	0.090	0.059	0.110	0.073	0.170	0.112	..
2.000-3.999	0.034	0.022			0.044	0.029	0.054	0.036	0.080	0.053	0.100	0.066	0.120	0.079	0.180	0.119	..
4.000-5.999	0.044	0.029			0.054	0.036	0.064	0.042	0.090	0.059	0.110	0.073	0.130	0.086	0.190	0.125	..
6.000-7.999	0.054	0.036			0.064	0.042	0.074	0.049	0.100	0.066	0.120	0.079	0.140	0.092	0.200	0.132	..
8.000-9.999	0.064	0.042			0.074	0.049	0.084	0.055	0.110	0.073	0.130	0.086	0.150	0.099	0.210	0.139	..
10.000-11.999	0.074	0.049			0.084	0.055	0.094	0.062	0.120	0.079	0.140	0.092	0.160	0.106	0.220	0.145	..
12.000-13.999	0.084	0.055			0.094	0.062	0.104	0.069	0.130	0.086	0.150	0.099	0.170	0.112	0.230	0.152	..
14.000-15.999	0.094	0.062	0.104	0.069	0.114	0.075	0.140	0.092	0.160	0.106	0.180	0.119	0.240	0.158	..		
16.000-17.999	0.104	0.069	0.114	0.075	0.124	0.082	0.150	0.099	0.170	0.112	0.190	0.125	0.250	0.165	..		
18.000-19.999	0.114	0.075	±15% of specified dimension; ±0.090 max.	±15% of specified dimension; ±0.015 min.	0.124	0.082	0.134	0.088	0.160	0.106	1.800	1.188	0.200	0.132	0.260	0.172	
20.000-21.999	0.124	0.082			0.134	0.088	0.144	0.095	0.170	0.112	0.190	0.125	0.210	0.139	0.270	0.178	..
22.000-24.000	0.134	0.088			0.144	0.095	0.154	0.102	0.180	0.119	0.200	0.132	0.220	0.145	0.280	0.185	..

Footnotes for Tables 11.2 through 11.4

① These Standard and Precision Tolerances are applicable to the average profile. The extrusion conditions required to produce the wide variety of alloy-temper and profile combinations require close review between customer and producer to determine critical characteristics and tolerance capability. Aggressive profile characteristics may require wider than standard tolerance and closer than precision tolerance may be feasible for other characteristics.

② The tolerance applicable to a dimension composed of two or more component dimensions is the sum of the tolerances of the component dimensions if all of the component dimensions are indicated.

③ Footnote is inactive.