

AEROSPACE MATERIAL SPECIFICATIONS

AMS 2231c

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TOLERANCES Carbon Steel Bars

1. PURPOSE: To publish established manufacturing tolerances.
2. APPLICATION: Tolerances shown herein apply, unless otherwise agreed upon by purchaser and vendor. These tolerances apply to all conditions, unless otherwise noted.
3. DIAMETER OR THICKNESS:
 - 3.1 Cold Finished:

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TABLE I

Nominal Diameter or Thickness Inches	Tolerances, Inch, Minus Only Maximum of Carbon Range, %			
	Up to 0.28, incl	Over 0.28 to 0.55 incl	All Carbons Stress Relieved	Over 0.55 and all carbons Heat Treated

ROUNDS

Up to 1.000, incl	0.002	0.003	0.004	0.006
Over 1.000 to 2.000, incl	0.003	0.004	0.006	0.008
Over 2.000 to 4.000, incl	0.004	0.005	0.008	0.010
Over 4.000 to 6.000, incl	0.005	0.006	0.010	0.012
Over 6.000 to 7.750, incl	0.006	0.008	0.012	0.016
Over 7.750 to 9.000, incl	0.007	0.010	0.014	0.018

HEXAGONS

Up to 0.3125, incl	0.002	0.003	0.004	0.006
Over 0.3125 to 1.000, incl	0.003	0.004	0.006	0.008
Over 1.000 to 2.500, incl	0.004	0.005	0.008	0.010
Over 2.500 to 3.125, incl	0.005	0.006	0.010	0.012

SQUARES

Up to 0.3125, incl	0.003	0.004	0.006	0.008
Over 0.3125 to 1.000, incl	0.004	0.005	0.008	0.010
Over 1.000 to 2.500, incl	0.005	0.006	0.010	0.012
Over 2.500 to 4.000, incl	0.006	0.008	0.012	0.016

TABLE I (Con't.)

FLATS

Nominal Width Inches				
Up to 0.750, incl	0.003	0.004	0.006	0.008
Over 0.750 to 1.500, incl	0.004	0.005	0.008	0.010
Over 1.500 to 3.000, incl	0.005	0.006	0.010	0.012
Over 3.000 to 4.000, incl	0.006	0.008	0.011	0.016
Over 4.000 to 6.000, incl	0.008	0.010	0.012	0.020
Over 6.000	0.013	--	--	--

3.1.1 When rough turned bars are permitted, the above tolerances shall be doubled.

3.1.2 The tolerance for flats applies to both width and thickness.

3.2 Ground and Polished Rounds:

ϕ	Nominal Diameter Inches	Tolerance, Inch, Minus Only
	Up to 2.5, excl	0.002
	2.5 to 4.0, incl	0.003

3.3 Hot Finished:

TABLE II

ROUNDS AND SQUARES

ϕ	Nominal Diameter or Thickness Inches	Tolerance, Inch		Out-of-Round or Out-of-Square Inch
		Plus	Minus	
	Up to 0.3125, incl	0.005	0.005	0.008
Over 0.3125	to 0.4375, incl	0.006	0.006	0.009
Over 0.4375	to 0.625, incl	0.007	0.007	0.010
Over 0.625	to 0.875, incl	0.008	0.008	0.012
Over 0.875	to 1.000, incl	0.009	0.009	0.013
Over 1.000	to 1.125, incl	0.010	0.010	0.015
Over 1.125	to 1.250, incl	0.011	0.011	0.016
Over 1.250	to 1.375, incl	0.012	0.012	0.018
Over 1.375	to 1.500, incl	0.014	0.014	0.021
Over 1.500	to 2.000, incl	0.016	0.016	0.023
Over 2.000	to 2.500, incl	0.031	0	0.023
Over 2.500	to 3.500, incl	0.047	0	0.035
Over 3.500	to 4.500, incl	0.063	0	0.046
Over 4.500	to 5.500, incl	0.078	0	0.058
Over 5.500	to 6.500, incl	0.125	0	0.070
Over 6.500	to 8.250, incl	0.156	0	0.085
Over 8.250	to 9.500, incl	0.188	0	0.100