

HIGH-STRENGTH STRUCTURAL BOLTS, NUTS AND WASHERS

Bolt Dimensional Standards ANSI B18.21

Nominal Size of Basic Bolt Dia.	E		F			G		H			R		L _T (Ref)	Y (Ref)	Runout of Bearing Surface FIR
	Body Dia.		Width Across Flats			Width Across Corners		Height			Radius of Fillet		Thread Length	Transi- tion Thread Length	
	Max	Min	Basic	Max	Min	Max	Min	Basic	Max	Min	Max	Min	Basic	Max	Max
1/2 0.5000	0.515	0.482	7/8	0.875	0.850	1.010	0.969	5/16	0.323	0.302	0.031	0.009	1.00	0.19	0.016
5/8 0.6250	0.642	0.605	1 1/16	1.062	1.031	1.227	1.175	25/64	0.403	0.378	0.062	0.021	1.25	0.22	0.019
3/4 0.7500	0.768	0.729	1 1/4	1.250	1.212	1.443	1.383	15/32	0.483	0.455	0.062	0.021	1.38	0.25	0.022
7/8 0.8750	0.895	0.852	1 7/16	1.438	1.394	1.660	1.589	35/64	0.563	0.531	0.062	0.031	1.50	0.28	0.025
1 1.0000	1.022	0.976	1 5/8	1.625	1.575	1.876	1.796	35/64	0.627	0.591	0.093	0.062	1.75	0.31	0.028
1 1/8 1.1250	1.149	1.098	1 13/16	1.812	1.756	2.093	2.002	11/16	0.718	0.658	0.093	0.062	2.00	0.34	0.032
1 1/4 1.2500	1.277	1.223	2	2.000	1.938	2.309	2.209	25/32	0.813	0.749	0.093	0.062	2.00	0.38	0.035
1 3/8 1.3750	1.404	1.345	2 3/16	2.188	2.119	2.526	2.416	27/32	0.878	0.810	0.093	0.062	2.25	0.44	0.038
1 1/2 1.5000	1.531	1.470	2 3/8	2.375	2.300	2.742	2.622	15/16	0.974	0.902	0.093	0.062	2.25	0.44	0.041

Washer Dimensions

Bolt Size E	Circular Washers				Square or Rectangular Beveled Washers for American Standard Beams and Channels		
	Nominal Outside Diameter	Nominal Diameter Of Hole	Thickness		Minimum Side Dimension	Mean Thickness	Slope or Taper in Thickness
			Min	Max			
1/2	1 1/16	17/32	0.097	0.177	1 3/4	5/16	1.6
5/8	1 1/4	11/16	0.122	0.177	1 3/4	5/16	1.6
3/4	1 1/2	13/16	0.122	0.177	1 3/4	5/16	1.6
7/8	1 3/4	15/16	0.136	0.177	1 3/4	5/16	1.6
1	2	1 1/8	0.136	0.177	1 3/4	5/16	1.6
1 1/8	2 1/4	1 1/4	0.136	0.177	2 1/4	5/16	1.6
1 1/4	2 1/2	1 3/8	0.136	0.177	2 1/4	5/16	1.6
1 3/8	2 3/4	1 1/2	0.136	0.177	2 1/4	5/16	1.6
1 1/2	3	1 5/8	0.136	0.177	2 1/4	5/16	1.6

Washer Dimensions Tolerance (inches)

Dimension	Washer Size
	To 1 1/2 In. Nominal Bolt Size, Incl.
Nominal diameter of hole	-0: + 1/32
Nominal outside dimensions	-1/32: + 1/4
Flatness: max. deviation from straight edge placed on "cut" side shall not exceed	0.01
Butt shall not project above immediately adjacent washer surface more than	0.01

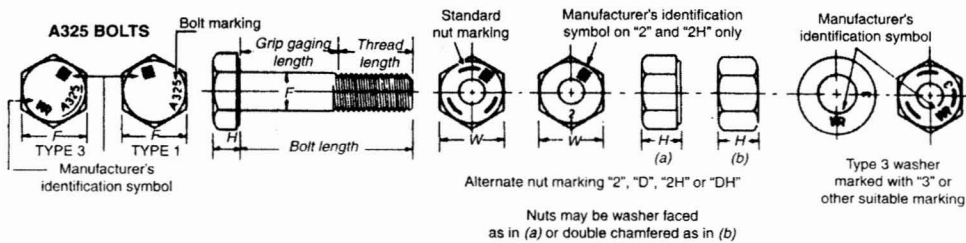
Nut Dimensions

Nut Size In Inches	Inches	
	Heavy Hex Nuts	
	Width across flats F	Height, G
1/2	7/8	21/64
5/8	1 1/16	35/64
3/4	1 5/16	47/64
7/8	1 7/16	55/64
1	1 5/8	63/64
1 1/8	1 13/16	1 7/64
1 1/4	2	1 7/32
1 3/8	2 3/16	1 11/32
1 1/2	2 3/8	1 15/32

STRUCTURAL BOLTS - HIGH STRENGTH
GRIP RANGES FOR HIGH STRENGTH STRUCTURAL BOLTS

Nom Bolt Dia and Thds per Inch	1/2-13		5/8-11		3/4-10		7/8-9		1-8		1-1/8-7		1-1/4-7		1-3/8-6		1-1/2-6	
Nom Bolt Length Inch	Grip Range, Inch																	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.50	0.55	0.79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.75	0.80	1.04	0.56	0.89	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.00	1.05	1.29	0.81	1.14	0.69	0.94	-	-	-	-	-	-	-	-	-	-	-	-
2.25	1.30	1.54	1.06	1.39	0.94	1.19	0.82	1.09	-	-	-	-	-	-	-	-	-	-
2.50	1.55	1.79	1.31	1.64	1.19	1.44	1.07	1.34	-	-	-	-	-	-	-	-	-	-
2.75	1.80	2.04	1.56	1.89	1.44	1.69	1.32	1.59	1.08	1.47	-	-	-	-	-	-	-	-
3.00	2.05	2.29	1.81	2.14	1.69	1.94	1.57	1.84	1.33	1.72	1.10	1.53	1.10	1.42	-	-	-	-
3.25	2.30	2.54	2.06	2.39	1.94	2.19	1.82	2.09	1.58	1.97	1.35	1.78	1.35	1.67	1.11	1.54	1.11	1.41
3.50	2.55	2.79	2.31	2.64	2.19	2.44	2.07	2.34	1.83	2.22	1.60	2.03	1.60	1.92	1.36	1.79	1.36	1.66
3.75	2.80	3.04	2.56	2.89	2.44	2.69	2.32	2.59	2.08	2.47	1.85	2.28	1.85	2.17	1.61	2.04	1.61	1.91
4.00	3.05	3.29	2.81	3.14	2.69	2.94	2.57	2.84	2.33	2.72	2.10	2.53	2.10	2.42	1.86	2.29	1.86	2.16
4.25	3.30	3.54	3.06	3.39	2.94	3.19	2.82	3.09	2.58	2.97	2.35	2.78	2.35	2.67	2.11	2.54	2.11	2.41
4.50	3.55	3.79	3.31	3.64	3.19	3.44	3.07	3.34	2.83	3.22	2.60	3.03	2.60	2.92	2.36	2.79	2.36	2.66
4.75	3.80	4.04	3.56	3.89	3.44	3.69	3.32	3.59	3.08	3.47	2.85	3.28	2.85	3.17	2.61	3.04	2.61	2.91
5.00	4.05	4.29	3.81	4.14	3.69	3.94	3.57	3.84	3.33	3.72	3.10	3.53	3.10	3.42	2.86	3.29	2.86	3.16
5.25	4.30	4.54	4.06	4.39	3.94	4.19	3.82	4.09	3.58	3.97	3.35	3.78	3.35	3.67	3.11	3.54	3.11	3.41
5.50	4.55	4.79	4.31	4.64	4.19	4.44	4.07	4.34	3.83	4.22	3.60	4.03	3.60	3.92	3.36	3.79	3.36	3.66
5.75	4.80	5.04	4.56	4.89	4.44	4.69	4.32	4.59	4.08	4.47	3.85	4.28	3.85	4.17	3.61	4.04	3.61	3.91
6.00	5.05	5.29	4.81	5.14	4.69	4.94	4.57	4.84	4.33	4.72	4.10	4.53	4.10	4.42	3.86	4.29	3.86	4.16
6.25	-	-	-	-	4.94	5.19	4.82	5.03	4.58	4.91	4.35	4.78	4.35	4.67	4.11	4.54	4.11	4.41
6.50	-	-	-	-	5.19	5.44	5.07	5.28	4.83	5.16	4.60	5.03	4.60	4.92	4.36	4.79	4.36	4.66
6.75	-	-	-	-	5.44	5.69	5.32	5.53	5.08	5.41	4.85	5.28	4.85	5.17	4.61	5.04	4.61	4.91
7.00	-	-	-	-	5.69	5.94	5.57	5.78	5.33	5.66	5.10	5.53	5.10	5.42	4.86	5.29	4.86	5.16
7.25	-	-	-	-	5.94	6.19	5.82	6.03	5.58	5.91	5.35	5.78	5.35	5.67	5.11	5.54	5.11	5.41
7.50	-	-	-	-	6.19	6.44	6.07	6.28	5.83	6.16	5.60	6.03	5.60	5.92	5.36	5.79	5.36	5.66
7.75	-	-	-	-	6.44	6.69	6.32	6.53	6.08	6.41	5.85	6.28	5.85	6.17	5.61	6.04	5.61	5.91
8.00	-	-	-	-	6.69	6.94	6.57	6.78	6.33	6.66	6.10	6.53	6.10	6.42	5.86	6.29	5.86	6.16

A325 BOLTS



A490 BOLTS

