

Table 5. American National Standard Hex Lag Screws (ANSI B18.2.1-1981)

Nominal Size* or Basic Product Diam.	Body or Shoulder Diam. E		Width Across Flats F		Width Across Corners G		Height H			Shoulder Length S	Radius of Fillet R	Thds. per Inch	Thread Dimensions					
	Max.	Min.	Basic	Max.	Min.	Max.	Min.	Basic	Max.				Min.	Pitch P	Flat at Root B	Depth of Thd. T	Root Diam. D1	
No. 10	0.1900	0.199	0.178	5/32	0.281	0.271	0.323	0.309	1/8	0.140	0.110	0.094	0.03	11	0.091	0.039	0.035	0.120
1/4	0.2500	0.260	0.237	3/8	0.438	0.425	0.505	0.484	1/64	0.188	0.150	0.094	0.03	10	0.100	0.043	0.039	0.173
3/8	0.3125	0.324	0.298	1/2	0.500	0.484	0.577	0.552	7/32	0.235	0.195	0.125	0.03	9	0.111	0.048	0.043	0.227
1/2	0.3750	0.388	0.360	5/8	0.562	0.544	0.650	0.620	1/4	0.268	0.226	0.125	0.03	7	0.143	0.062	0.055	0.265
3/4	0.4375	0.452	0.421	3/4	0.625	0.603	0.722	0.687	19/64	0.316	0.272	0.156	0.03	7	0.143	0.062	0.055	0.328
1/2	0.5000	0.515	0.482	3/4	0.750	0.725	0.866	0.826	11/32	0.364	0.302	0.156	0.03	6	0.167	0.072	0.064	0.371
3/8	0.6250	0.642	0.605	15/16	0.938	0.906	1.083	1.033	27/64	0.444	0.378	0.312	0.06	5	0.200	0.086	0.077	0.471
3/4	0.7500	0.768	0.729	1 1/8	1.125	1.088	1.299	1.240	1/2	0.524	0.455	0.375	0.06	4 1/2	0.222	0.096	0.085	0.579
1	0.8750	0.895	0.852	1 1/16	1.312	1.269	1.516	1.447	37/64	0.604	0.531	0.375	0.06	4	0.250	0.108	0.096	0.683
1 1/4	1.0000	1.022	0.976	1 1/2	1.500	1.450	1.732	1.653	43/64	0.700	0.591	0.625	0.09	3 1/2	0.286	0.123	0.110	0.780
1 1/2	1.1250	1.149	1.098	1 11/16	1.688	1.631	1.949	1.859	3/4	0.780	0.658	0.625	0.09	3 1/4	0.308	0.133	0.119	0.887
1 3/4	1.2500	1.277	1.223	1 7/8	1.875	1.812	2.165	2.066	27/32	0.876	0.749	0.625	0.09	3 1/4	0.308	0.133	0.119	1.012

All dimensions in inches. * When specifying decimal nominal size, zeros before decimal point and in fourth decimal place are omitted. Minimum thread length is 1/2 length of screw plus 0.50 inch, or 6.00 inches, whichever is shorter. Screws too short for the formula thread length shall be threaded as close to the head as practicable. Thread formulas: Pitch = 1 ÷ thds. per inch. Flat at root = 0.4305 × pitch. Depth of single thread = 0.385 × pitch.

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BOLTS AND NUTS

BOLTS AND NUTS

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ASTM and SAE Grade Markings for Steel Bolts and Screws (ANSI B18.2.1-1981, Appendix III)

Grade Marking	Specification	Material
	SAE — Grade 1	Low or Medium Carbon Steel
	ASTM — A307	Low Carbon Steel
	SAE — Grade 5	Low or Medium Carbon Steel
	ASTM — A 499	Medium Carbon Steel, Quenched and Tempered
	SAE — Grade 5.2	Low Carbon Martensite Steel, Quenched and Tempered
	ASTM — A 325 Type 1	Medium Carbon Steel, Quenched and Tempered
	ASTM — A 325 Type 2	Low Carbon Martensite Steel, Quenched and Tempered
	ASTM — A 325 Type 3	Atmospheric Corrosion (Weathering) Steel, Quenched and Tempered
	ASTM — A 354 Grade BC	Alloy Steel, Quenched and Tempered
	SAE — Grade 8	Medium Carbon Alloy Steel, Quenched and Tempered, Roll Threaded After Heat Treatment
	ASTM — A 354 Grade BD	Medium Carbon Alloy Steel, Quenched and Tempered
	SAE — Grade 8.2	Low Carbon Martensite Steel, Quenched and Tempered
	ASTM — A 490 Type 1	Alloy Steel, Quenched and Tempered
	ASTM — A 490 Type 3	Atmospheric Corrosion (Weathering) Steel, Quenched and Tempered

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