

ASME B18.5

Round head bolts - inch series (carriage, step and elevator bolt tables)



Standard	ASME B18.5
Material	Carbon Steel
Property Class	Grade 5
Surface Finish	Zinc Plated, Hot Dip Galvanized, Plain
Thread	UNC

BASIS OF SPECIFICATION		WHICH STANDARD GOVERNS WHAT
Dimensions to	ASME B18.5:2008	
Carbon steel / Alloy steel mechanical properties to	SAE J429	

MECHANICAL PROPERTIES					REQUIRED VALUES PER ISO 898-1
Class	Rm min.	Yield requirement	Elongation requirement	Hardness	Source

Property class Grade 5 is supplied to this standard; its requirement values are not tabulated here. Refer to the standard.

DIMENSIONAL DATA - SIZES WE SUPPLY

ALL DIMENSIONS PER THE STANDARD

Same for every size listed: Thread Series: UNC · Thread Class: 2A · Material: Carbon Steel · Property Class / Grade: Grade 5 · Finish: Zinc Plated, Hot Dip Galvanized, Plain

Nominal Diameter - in	L Length - in	TPI Threads Per Inch	Basic Major Diameter - in	E max Body Diameter Max - in	E min Body Diameter Min - in	A Head Diameter - in	A (min) Head Diameter - in	H Nominal Head Height - in	H (min) Head Height - in	O (max) Square Neck Width - in	O (min) Square Neck Width - in	P (max) Square Neck Height - in	P (min) Square Neck Height - in	R (max) Underhead Radius - in	moq MOQ
1/4-20 UNC	0.75	20	0.25	0.26	0.213	0.594	0.563	0.145	0.125	0.26	0.245	0.156	0.125	0.031	1000
1/4-20 UNC	0.875	20	0.25	0.26	0.213	0.594	0.563	0.145	0.125	0.26	0.245	0.156	0.125	0.031	1000
1/4-20 UNC	1	20	0.25	0.26	0.213	0.594	0.563	0.145	0.125	0.26	0.245	0.156	0.125	0.031	1000
1/4-20 UNC	1.25	20	0.25	0.26	0.213	0.594	0.563	0.145	0.125	0.26	0.245	0.156	0.125	0.031	1000
1/4-20 UNC	1.5	20	0.25	0.26	0.213	0.594	0.563	0.145	0.125	0.26	0.245	0.156	0.125	0.031	1000
1/4-20 UNC	1.75	20	0.25	0.26	0.213	0.594	0.563	0.145	0.125	0.26	0.245	0.156	0.125	0.031	1000
1/4-20 UNC	2	20	0.25	0.26	0.213	0.594	0.563	0.145	0.125	0.26	0.245	0.156	0.125	0.031	1000
1/4-20 UNC	2.25	20	0.25	0.26	0.213	0.594	0.563	0.145	0.125	0.26	0.245	0.156	0.125	0.031	1000
1/4-20 UNC	2.5	20	0.25	0.26	0.213	0.594	0.563	0.145	0.125	0.26	0.245	0.156	0.125	0.031	1000
1/4-20 UNC	2.75	20	0.25	0.26	0.213	0.594	0.563	0.145	0.125	0.26	0.245	0.156	0.125	0.031	1000
1/4-20 UNC	3	20	0.25	0.26	0.213	0.594	0.563	0.145	0.125	0.26	0.245	0.156	0.125	0.031	1000
1/4-20 UNC	3.25	20	0.25	0.26	0.213	0.594	0.563	0.145	0.125	0.26	0.245	0.156	0.125	0.031	1000
5/16-18 UNC	1	18	0.3125	0.324	0.272	0.719	0.688	0.176	0.156	0.324	0.307	0.187	0.156	0.031	1000
5/16-18 UNC	1.25	18	0.3125	0.324	0.272	0.719	0.688	0.176	0.156	0.324	0.307	0.187	0.156	0.031	1000
5/16-18 UNC	1.5	18	0.3125	0.324	0.272	0.719	0.688	0.176	0.156	0.324	0.307	0.187	0.156	0.031	1000
5/16-18 UNC	1.75	18	0.3125	0.324	0.272	0.719	0.688	0.176	0.156	0.324	0.307	0.187	0.156	0.031	1000
5/16-18 UNC	2	18	0.3125	0.324	0.272	0.719	0.688	0.176	0.156	0.324	0.307	0.187	0.156	0.031	1000
5/16-18 UNC	2.25	18	0.3125	0.324	0.272	0.719	0.688	0.176	0.156	0.324	0.307	0.187	0.156	0.031	1000
5/16-18 UNC	2.5	18	0.3125	0.324	0.272	0.719	0.688	0.176	0.156	0.324	0.307	0.187	0.156	0.031	1000
5/16-18 UNC	2.75	18	0.3125	0.324	0.272	0.719	0.688	0.176	0.156	0.324	0.307	0.187	0.156	0.031	1000

DIMENSIONAL DATA - SIZES WE SUPPLY (CONTINUED)

ALL DIMENSIONS PER THE STANDARD

Nominal Diameter - in	L Length - in	TPI Threads Per Inch	Basic Major Diameter - in	E max Body Diameter Max - in	E min Body Diameter Min - in	A Head Diameter - in	A (min) Head Diameter - in	H Nominal Head Height - in	H (min) Head Height - in	O (max) Square Neck Width - in	O (min) Square Neck Width - in	P (max) Square Neck Height - in	P (min) Square Neck Height - in	R (max) Underhead Radius - in	moq MOQ
5/16-18 UNC	3	18	0.3125	0.324	0.272	0.719	0.688	0.176	0.156	0.324	0.307	0.187	0.156	0.031	1000
5/16-18 UNC	3.5	18	0.3125	0.324	0.272	0.719	0.688	0.176	0.156	0.324	0.307	0.187	0.156	0.031	1000
5/16-18 UNC	4	18	0.3125	0.324	0.272	0.719	0.688	0.176	0.156	0.324	0.307	0.187	0.156	0.031	1000
3/8-16 UNC	1.25	16	0.375	0.388	0.329	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188	0.031	1000
3/8-16 UNC	1.5	16	0.375	0.388	0.329	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188	0.031	1000
3/8-16 UNC	1.75	16	0.375	0.388	0.329	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188	0.031	1000
3/8-16 UNC	2	16	0.375	0.388	0.329	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188	0.031	1000
3/8-16 UNC	2.25	16	0.375	0.388	0.329	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188	0.031	1000
3/8-16 UNC	2.5	16	0.375	0.388	0.329	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188	0.031	1000
3/8-16 UNC	2.75	16	0.375	0.388	0.329	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188	0.031	1000
3/8-16 UNC	3	16	0.375	0.388	0.329	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188	0.031	1000
3/8-16 UNC	3.25	16	0.375	0.388	0.329	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188	0.031	1000
3/8-16 UNC	3.5	16	0.375	0.388	0.329	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188	0.031	1000
3/8-16 UNC	3.75	16	0.375	0.388	0.329	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188	0.031	1000
3/8-16 UNC	4	16	0.375	0.388	0.329	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188	0.031	1000
3/8-16 UNC	4.5	16	0.375	0.388	0.329	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188	0.031	1000
3/8-16 UNC	5	16	0.375	0.388	0.329	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188	0.031	1000
7/16-14 UNC	1.5	14	0.4375	0.452	0.385	0.969	0.907	0.239	0.219	0.452	0.431	0.25	0.219	0.031	500
7/16-14 UNC	1.75	14	0.4375	0.452	0.385	0.969	0.907	0.239	0.219	0.452	0.431	0.25	0.219	0.031	500
7/16-14 UNC	2	14	0.4375	0.452	0.385	0.969	0.907	0.239	0.219	0.452	0.431	0.25	0.219	0.031	500
7/16-14 UNC	2.25	14	0.4375	0.452	0.385	0.969	0.907	0.239	0.219	0.452	0.431	0.25	0.219	0.031	500
7/16-14 UNC	2.5	14	0.4375	0.452	0.385	0.969	0.907	0.239	0.219	0.452	0.431	0.25	0.219	0.031	500
7/16-14 UNC	2.75	14	0.4375	0.452	0.385	0.969	0.907	0.239	0.219	0.452	0.431	0.25	0.219	0.031	500
7/16-14 UNC	3	14	0.4375	0.452	0.385	0.969	0.907	0.239	0.219	0.452	0.431	0.25	0.219	0.031	500
7/16-14 UNC	3.5	14	0.4375	0.452	0.385	0.969	0.907	0.239	0.219	0.452	0.431	0.25	0.219	0.031	500
7/16-14 UNC	4.5	14	0.4375	0.452	0.385	0.969	0.907	0.239	0.219	0.452	0.431	0.25	0.219	0.031	500
1/2-13 UNC	1.5	13	0.5	0.515	0.444	1.094	1.032	0.27	0.25	0.515	0.492	0.281	0.25	0.031	500
1/2-13 UNC	1.75	13	0.5	0.515	0.444	1.094	1.032	0.27	0.25	0.515	0.492	0.281	0.25	0.031	500
1/2-13 UNC	2	13	0.5	0.515	0.444	1.094	1.032	0.27	0.25	0.515	0.492	0.281	0.25	0.031	500
1/2-13 UNC	2.25	13	0.5	0.515	0.444	1.094	1.032	0.27	0.25	0.515	0.492	0.281	0.25	0.031	500
1/2-13 UNC	2.5	13	0.5	0.515	0.444	1.094	1.032	0.27	0.25	0.515	0.492	0.281	0.25	0.031	500
1/2-13 UNC	2.75	13	0.5	0.515	0.444	1.094	1.032	0.27	0.25	0.515	0.492	0.281	0.25	0.031	500
1/2-13 UNC	3	13	0.5	0.515	0.444	1.094	1.032	0.27	0.25	0.515	0.492	0.281	0.25	0.031	500
1/2-13 UNC	3.5	13	0.5	0.515	0.444	1.094	1.032	0.27	0.25	0.515	0.492	0.281	0.25	0.031	500

DIMENSIONAL DATA - SIZES WE SUPPLY (CONTINUED)

ALL DIMENSIONS PER THE STANDARD

Nominal Diameter - in	L Length - in	TPI Threads Per Inch	Basic Major Diameter - in	E max Body Diameter Max - in	E min Body Diameter Min - in	A Head Diameter - in	A (min) Head Diameter - in	H Nominal Head Height - in	H (min) Head Height - in	O (max) Square Neck Width - in	O (min) Square Neck Width - in	P (max) Square Neck Height - in	P (min) Square Neck Height - in	R (max) Underhead Radius - in	moq MOQ
1/2-13 UNC	4	13	0.5	0.515	0.444	1.094	1.032	0.27	0.25	0.515	0.492	0.281	0.25	0.031	500
1/2-13 UNC	4.5	13	0.5	0.515	0.444	1.094	1.032	0.27	0.25	0.515	0.492	0.281	0.25	0.031	500
1/2-13 UNC	5	13	0.5	0.515	0.444	1.094	1.032	0.27	0.25	0.515	0.492	0.281	0.25	0.031	500
5/8-11 UNC	2	11	0.625	0.642	0.559	1.344	1.219	0.344	0.313	0.642	0.616	0.344	0.313	0.062	250
5/8-11 UNC	2.25	11	0.625	0.642	0.559	1.344	1.219	0.344	0.313	0.642	0.616	0.344	0.313	0.062	250
5/8-11 UNC	2.5	11	0.625	0.642	0.559	1.344	1.219	0.344	0.313	0.642	0.616	0.344	0.313	0.062	250
5/8-11 UNC	2.75	11	0.625	0.642	0.559	1.344	1.219	0.344	0.313	0.642	0.616	0.344	0.313	0.062	250
5/8-11 UNC	3	11	0.625	0.642	0.559	1.344	1.219	0.344	0.313	0.642	0.616	0.344	0.313	0.062	250
5/8-11 UNC	3.25	11	0.625	0.642	0.559	1.344	1.219	0.344	0.313	0.642	0.616	0.344	0.313	0.062	250
5/8-11 UNC	3.5	11	0.625	0.642	0.559	1.344	1.219	0.344	0.313	0.642	0.616	0.344	0.313	0.062	250
5/8-11 UNC	4	11	0.625	0.642	0.559	1.344	1.219	0.344	0.313	0.642	0.616	0.344	0.313	0.062	250
5/8-11 UNC	4.5	11	0.625	0.642	0.559	1.344	1.219	0.344	0.313	0.642	0.616	0.344	0.313	0.062	250
5/8-11 UNC	5	11	0.625	0.642	0.559	1.344	1.219	0.344	0.313	0.642	0.616	0.344	0.313	0.062	250
5/8-11 UNC	5.5	11	0.625	0.642	0.559	1.344	1.219	0.344	0.313	0.642	0.616	0.344	0.313	0.062	250
3/4-10 UNC	2.5	10	0.75	0.768	0.678	1.594	1.469	0.406	0.375	0.768	0.741	0.406	0.375	0.062	250
3/4-10 UNC	3	10	0.75	0.768	0.678	1.594	1.469	0.406	0.375	0.768	0.741	0.406	0.375	0.062	250
3/4-10 UNC	4	10	0.75	0.768	0.678	1.594	1.469	0.406	0.375	0.768	0.741	0.406	0.375	0.062	250
3/4-10 UNC	4.5	10	0.75	0.768	0.678	1.594	1.469	0.406	0.375	0.768	0.741	0.406	0.375	0.062	250
3/4-10 UNC	5	10	0.75	0.768	0.678	1.594	1.469	0.406	0.375	0.768	0.741	0.406	0.375	0.062	250

TECHNICAL SPECIFICATIONS

Nominal Diameter	1/4-20 UNC	Length	0.75
Threads Per Inch	20	Thread Class	2A
Basic Major Diameter	0.25	Body Diameter Max	0.26
Body Diameter Min	0.213	Head Diameter	0.594
Head Diameter (min)	0.563	Nominal Head Height	0.145
Head Height (min)	0.125	Square Neck Width (max)	0.26
Square Neck Width (min)	0.245	Square Neck Height (max)	0.156
Square Neck Height (min)	0.125	Underhead Radius (max)	0.031
moq	1000	Material	Carbon Steel
Property Class / Grade	Grade 5	Finish	Zinc Plated, Hot Dip Galvanized, Plain
Property Class	Grade 5	Surface Finish	Zinc Plated, Hot Dip Galvanized, Plain

MARKING

Steel — Required

What	Two marks are mandatory. 2.9.1: the grade symbol required by the applicable specification for chemistry and mechanical properties (ASTM A307 Grade A for steel, per Clause 2.8.1). 2.9.2: a source symbol identifying whoever accepts responsibility for conformance. The symbols themselves are defined in ASTM A307 / F468 / F593, which we do not hold.
Where	Not fixed by this Standard
Sizes	All sizes
Clause	ASME B18.5-2008, 2.9 Identification Symbols (2.9.1 grade, 2.9.2 source), with materials in 2.8

Clause 2.9 of ASME B18.5-2008 makes two markings mandatory. 2.9.1: each product shall be marked in accordance with the requirements of the applicable specification for its chemistry and mechanical properties. 2.9.2: each product shall be marked to identify the source accepting responsibility for conformance.

Clause 2.8.1 names that specification as ASTM A307 Grade A for steel bolts, stress relieved as that standard requires. Step bolts and elevator bolts are excluded from the A307 conformance route: because of their head configurations they are considered conforming if the tensile strength in pounds meets the value in the applicable material standard.

Clause 2.8.2 sends non-ferrous materials to ASTM F468 and corrosion-resistant steels to ASTM F593.

Clause 1.5 fixes the designation order: product name and standard, nominal diameter with threads per inch and nominal length, then material grade or identification and protective coating if required. Example: Round head short square neck bolt ASME B18.5, 3/8-16 x 3, steel ASTM A 307, Grade A, zinc plated ASTM F 1941, Fe/Zn 3A.

Confirm the ordered property class before production.

INSPECTION DOCUMENTS WE CAN ISSUE

EN 10204 3.1 material certificate	Can be included when agreed in the order.
Dimensional inspection report	Can be provided for the agreed inspection scope.
Certificate of conformity	Can be issued against the confirmed order requirements.
Mechanical test report	Available when the required tests are agreed before production.
Chemical analysis report	Available when the material verification scope is agreed.
Coating inspection report	Can record the coating checks agreed for the order.

REFERENCES & NOTES

Note: , , , .