


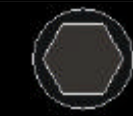




	<b>Grade 8</b>	<b>AN</b>	<b>NAS</b>	<b>MS200X / NAS10X</b>	<b>MS21250-X / NAS62X</b>	<b>NAS - stainless</b>	<b>NAS - titanium</b>
<b>Tensile Strength</b>	150,000 psi	125,000 psi	160,000 psi	160,000 psi	180,000 psi	160,000 psi	160,000 psi
<b>Shear Strength</b>	91,000 psi	75,000 psi	95,000 psi	96,000 psi	108,000 psi	95,000 psi	95,000 psi
<b>Material</b>	Med. Carbon Alloy Steel	High Carbon Alloy Steel	High Carbon Alloy Steel	High Carbon Alloy Steel	High Carbon Alloy Steel	A286 Stainless	6Al4V Titanium
<b>Plating</b>	Gold Cad.	Gold Cad.	Gold Cad.	Gold Cad.	Gold/Silver Cad.	Unplated or Gold Cad.	Unplated or Gold Cad.
<b>Temp. Rating</b>	450° F	450° F	450° F	450° F	450° F	1200° F	500° F
<b>Notes:</b>	- Fine and Course Threads	- Fine Threaded	- 110X / 620X (short thread) - 130X / 660X (long thread) - Fine Thread	- Use MS20002 washer - Fine Thread	- Use MS20002 washer - Fine Threaded	- 630X (short thread) - 670X (long thread) - Fine Thread	- 65X / 640X (short thread) - 67X / 680X (long thread) - Fine Thread
							
	<b>NAS1102-X Torqset</b>	<b>AN526 Truss Head</b>	<b>AN507 Flat Head</b>	<b>Socket Head Cap Screw</b>	<b>Button Head Cap Screw</b>	<b>Flat Head Cap Screw</b>	<b>12pt. Grade 8</b>
<b>Tensile Strength</b>	160,000 psi	55,000 psi	55,000 psi	150,000 psi	150,000 psi	150,000 psi	150,000 psi
<b>Shear Strength</b>				91,000 psi	91,000 psi	91,000 psi	91,000 psi
<b>Material</b>	High Carbon Alloy Steel	Low Carbon Steel	Low Carbon Steel	High Carbon Alloy Steel	High Carbon Alloy Steel	High Carbon Alloy Steel	Med. Carbon Alloy Steel
<b>Plating</b>	Gold Cad.	Silver Cad.	Gold Cad.	Black Oxide	Black Oxide	Black Oxide	Black Oxide
<b>Temp. Rating</b>	450° F	450° F	450° F	550° F	550° F	550° F	450° F
<b>Notes:</b>	- 100° c'sink - Torqset drive - Fine Thread	- Non Structural - Phillips Head - Fine Thread	- Non Structural - Phillips Head - Fine Thread - 100° c'sink	- Available in Stainless - Coarse and Fine Threads	- Available in Stainless Steel - Coarse and Fine Threads	- Available in Stainless Steel - Coarse and Fine Threads - 82° c'sink	- Coarse Thread



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## Bolt Identification and Measuring

<b>Hex, Socket/Button Head, 12 pt. Grade 8:</b> All hex head, socket head, button head and 12 point grade bolts are measured the same: Diameter, thread pitch, under head length. They are ordered the same: Diameter (1/4) - Thread pitch (20) x Under head length (1-1/2") or 1/4-20x1-1/2".	<b>Flat Head Bolts / Screws:</b> Flat head cap screws are measured pretty much the same as hex head bolts, but the overall length is measured rather than the under head length. See the below illustration for measuring information. <i>This system applies to NAS flathead fasteners as well, jus substitute the dash number for the length (1-1/2" length = -24: 24/16<sup>th</sup>s = 1-1/2) and diameter (1/4 = 4/16 = -4)</i>
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**1/4-20 x 1-1/2"**  
 1/4 = diameter  
 20 = thread pitch  
 1-1/2" = Length

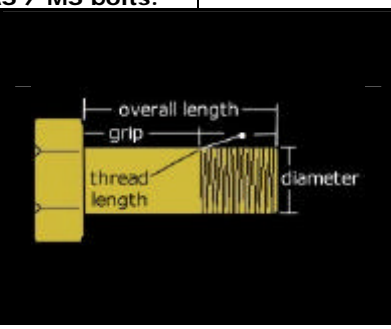
### Thread Pitch (threads per inch):

Diameter	Coarse (UNC)	Fine (UNF)
2	56	-
4	40	-
6 (06)	32	-
8 (08)	32	-
10 (-3)	24	32
1/4 (-4)	20	28
5/16 (-5)	18	24
3/8 (-6)	16	24
7/16 (-7)	14	20
1/2 (-8)	13	20

**1/4-20 x 1-1/2"**  
 1/4 = diameter  
 20 = thread pitch  
 1-1/2" = Length

<b>Aircraft (NAS / MS) Bolts:</b> All of the pertinent information about aircraft bolts is shown in their part number. All of their measurements (grip and diameter) are in 1/16th increments. They are ordered by style (see identification page), diameter and grip length. All aircraft fasteners are fine threaded. To determine the overall length, add the grip to the thread length (see table below). <b>See above flathead measuring guide for flathead NAS / MS bolts.</b>	<b>Aircraft (AN) Bolts:</b> AN bolts have little rhyme or reason to how they are measured. They are ordered by diameter (again, using the 1/16th dash #), but the grip / overall length has to be derived from a separate chart.
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**NAS1304-28**  
**NAS13:** Bolt series / style (see identification page)  
**04:** Diameter 4/16 = 1/4  
**-28:** Grip length 28/16 = 1.75")  
**1304-28** = 1/4-28 thread, .425 thread length + 1.75" grip = 2.175" under head length



**AN6-15A**  
**AN:** Bolt series / style  
**6:** Diameter 6/16 = 3/8  
**-15:** Grip length (see chart) - 1.060"  
**A:** No hole in head or shank  
**AN6-15A** = 3/8-24 thread size, 1.70" under head length (see chart)

### NAS / MS Thread Lengths:

Bolt Diameter	Bolt Style (see bolt ID chart)									
	11XX	62XX	13XX	66XX	65X	67X	64XX	62X	21250-X	2000X
-3 (10-32)	.276	.323	.338	.345	.276	.338	.323	-	.420	-
-4 (1/4-28)	.316	.370	.425	.425	.316	.425	.370	.485	.492	.475
-5 (5/16-24)	.375	.438	.469	.469	.375	.469	.438	.572	.579	.537
-6 (3/8-24)	.391	.454	.578	.578	.391	.578	.454	.619	.625	.662
-7 (7/16-20)	.453	.528	.594	.694	.453	.594	.528	.694	.721	.787
-8 (1/2-20)	.453	.528	.735	.735	.453	.753	.528	.741	.768	.787

x = Bolt Diameter