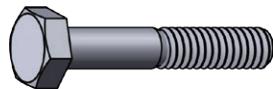
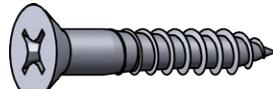


Fastener Basics

Common Fastener Types



Hex bolts, or hex cap screws, are used in machinery and construction. Can be used with a nut, or in a tapped hole. Fully threaded hex bolts are also known as tap bolts.



Wood screws have large threads and a smooth shank for pulling two pieces of material together. They can be used in wood and other soft materials.



Sheet metal screws have sharp points and threads, and are designed to be driven directly into sheet metal. They can also be used in softer materials like plastic, fiberglass, or wood.



Machine screws are fully threaded for use with a nut or in a tapped hole. Certain types are sometimes referred to as stove bolts.



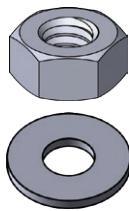
Socket screws are machine screws with an internal hex socket (Allen) drive. Longer lengths may have a smooth shank.



Lag bolts, or lag screws, are large wood screws with hex heads. Typically used for wood construction.



Carriage bolts have smooth, domed heads with a square section underneath that pulls into the material to prevent spinning during installation.



Nuts are used to fasten machine threaded fasteners in through-hole applications. Lock nuts help prevent loosening.

Washers spread the load over a greater surface area when tightening a bolt, screw or nut. Lock washers help prevent loosening.

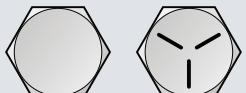
Tip: Find a more comprehensive fastener type chart at <http://boltdepot.com/info>

Grade/Class & Fastener Strength

Fastener **Grade** (US) or **Class** (metric) refers to the mechanical properties of the fastener material. Generally, a higher number indicates a stronger, more hardened (but also more brittle) fastener.

For a chart of fastener grades, head markings and mechanical properties, see Bolt Depot's Grade markings and Strength Chart at <http://boltdepot.com/info>

US bolt head markings



Low Carbon Grade 5 Grade 8

Metric bolt head markings



Class 8.8 Class 10.9 Class 12.9

Note: In addition to these markings, the head will often have a manufacturer stamp.

Fastener Materials

Note: Do not rely on this guide for color-matching. The appearance of these materials sometimes differs significantly from the photos below.

Zinc-plated steel is a low carbon steel for general use. Relatively inexpensive, with the zinc plating providing moderate corrosion resistance suitable for indoors or otherwise dry conditions. Color is either a blue-ish tint or yellow depending on the exact process.



Hot-dipped galvanized steel has a thicker zinc coating for better corrosion resistance, making it suitable for outdoor use. Because of the thick plating, only galvanized nuts and washers will fit galvanized bolts. The coating typically has a rough, dull grey finish.



Stainless steel offers good corrosion resistance, making it suitable for outdoor use and marine applications, but is more expensive than zinc plated.



Chrome and nickel plated steel are smooth and polished for appearance. The plating offers moderate corrosion resistance.



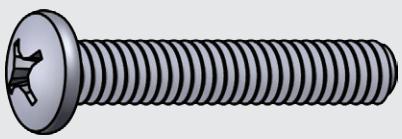
Brass and bronze are copper alloys with good corrosion resistance. More expensive than steel, these materials are typically used for decorative applications. Colors can vary significantly.



Alloy steel is highly hardened and usually black oxide and/or oil coated, offering little corrosion resistance.



How Fasteners are Notated: An Example



Machine screws, Phillips pan head, Stainless steel 18-8, #12-24 x 1"

Fastener type

Material

Diameter

Length

Thread Count (TPI)

Drive Types



Phillips and Slotted drives are common in screws, but prone to cam-out (stripping).



Combo drives, that can be used with either driver, are available for many fastener types.



Frearson and Pozidriv are similar to Phillips, but less prone to cam-out.



Hex socket (Allen) drives are compact and easy to drive, but prone to cam-out.



Star and Square drive are resistant to cam-out and can be installed single-handed.

Note: Most drive types (Frearson and Slotted being notable exceptions) require the correct driver size for proper installation.

Head Styles



Hex heads are typically used with larger bolts and screws, and tightened with a wrench.



Pan heads have a slightly domed head that sits above the surface.



Flat heads are installed in a countersunk hole for a flat surface.



Round heads are tall domed heads, used primarily for decorative purposes.



Oval heads are a low domed and countersunk heads, used primarily for decorative purposes.



Truss heads are slightly domed, with a wide head for an extra large surface area.



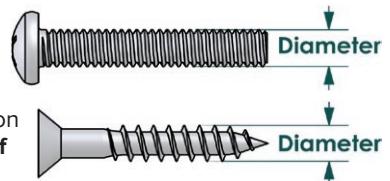
Socket heads are narrow with a socket drive, and knurled or smooth sides.



Button heads feature a medium dome. Typically used with a hex socket drive.

Measuring Diameter

For most types of fasteners, the diameter is measured on the **outside of the threads**.



Note: US diameters under 1/4" are given as numbers (e.g. #12) instead of inches, in order of increasing size. If you need to find the actual diameter, use a table corresponding to your fastener type at <http://boltdepot.com/info>

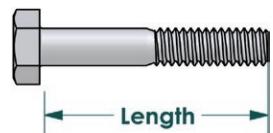
Thread Count & Thread Pitch

Machine threaded fasteners specify a thread density in **Threads Per Inch** (US) or as a **Thread Pitch** in mm (Metric).

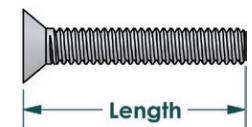
For a given diameter, a fastener may be available in **coarse** (standard), **fine** and sometimes **super fine** thread.

Measuring Length

Fastener length is usually measured from where the material is assumed to be to the end of the fastener.

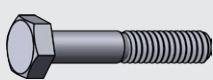


Thus, countersunk fasteners are measured overall and non-countersunk fasteners are measured from under the head.



Nut & Washer Sizes

Nut and washer sizes indicate **the screw or bolt they fit**. For example:



3/8"-16 Hex Bolt



3/8" Washer



3/8" -16 Nut

Different washer patterns have different **outside diameters**. For example, hardened US washers are available in **USS** (wider) and **SAE** (narrower) patterns. Fender washers have large outside diameters.



1/4"
SAE



1/4"
USS

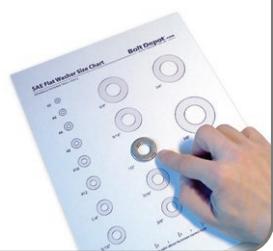


1/4" x 1"
Fender

More Information

At <http://boltdepot.com/info> you'll find:

- In-depth fastener info
- Charts and tables
- Printable lay-over charts and tools for quickly identifying fastener sizes and types
- Much more...

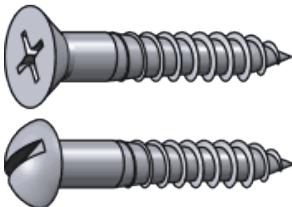


Fastener Type Chart

www.boltdepot.com/tools

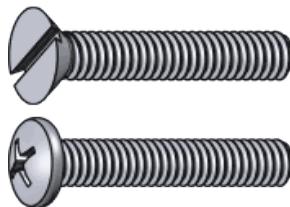
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Fastener Categories



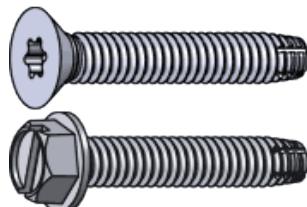
Wood Screws

Screws with a smooth shank and tapered point for use in wood. Abbreviated WS.



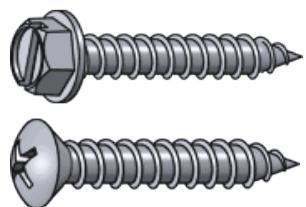
Machine Screws

Screws with threads for use with a nut or tapped hole. Abbreviated MS.



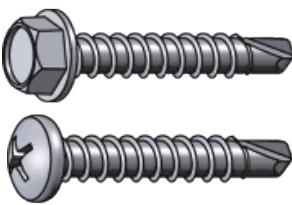
Thread Cutting Machine Screws

Machine screws with a thread cutting (self tapping) point.



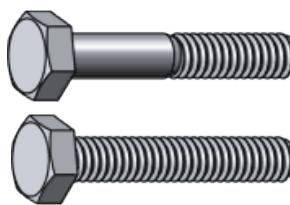
Sheet Metal Screws

Fully threaded screws with a point for use in sheet metal. Abbreviated SMS.



Self Drilling SMS

A sheet metal screw with a self drilling point.



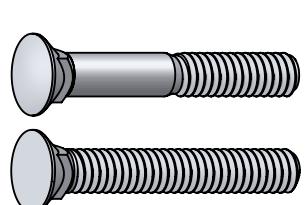
Hex Bolts

Bolts with a hexagonal head with threads for use with a nut or tapped hole. Abbreviated HHMB or HXBT.



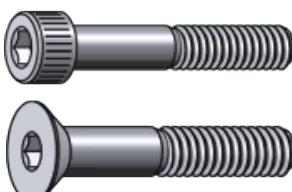
Carriage Bolts

Bolts with a smooth rounded head that has a small square section underneath.



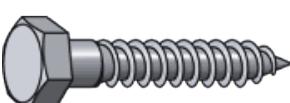
Plow Bolts

Similar to carriage bolts but used for attaching the cutting edge of a plow to the plow blade.



Socket Screws

Socket screws, also known as Allen Head, are fastened with a hex Allen wrench.



Lag Bolts

Bolts with a wood thread and pointed tip. Abbreviated Lag.



Eye Bolts

A bolt with a circular ring on the head end. Used for attaching a rope or chain.



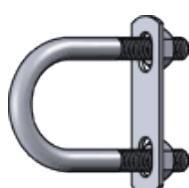
Eye Lags

Similar to an eye bolt but with wood threads instead of machine thread.



J-Bolts

J shaped bolts are used for tie-downs or as an open eye bolt.



U-Bolts

Bolts in U shape for attaching to pipe or other round surfaces. Also available with a square bend.



Shoulder Bolts

Shoulder bolts (also known as stripper bolts) are used to create a pivot point.



Elevator Bolts

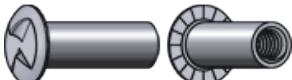
Elevator bolts are often used in conveyor systems. They have a large, flat head.

Fastener Type Chart

www.boltdepot.com/tools

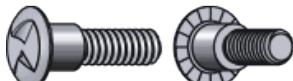
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Fastener Categories (continued)



Sex Bolts

Sex bolts (a.k.a. barrel nuts or Chicago bolts) have a female thread and are used for through bolting applications where a head is desired on both sides of the joint.



Mating Screws

Mating screws have a shoulder that matches the diameter of the sex bolts they are used with.



Hanger Bolts

Hanger bolts have wood thread on one end and machine thread on the other end



Set Screws

Machine screws with no head for screwing all the way into threaded holes.



Timber Bolts

Machine threaded fasteners with a wide domed head. The head has fins underneath that prevent the bolt from spinning during installation. Typically used in wood.



Cotter Pins

Cotter or split pins have two tines which are bent apart to hold them in place.



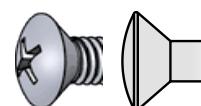
Rivets

Used to join sheets of metal. During installation the rivet body is deformed to permanently lock in place. Blind rivets can be installed without access to the back side of the material.



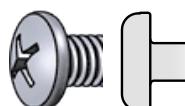
Flat

A countersunk head with a flat top.
Abbreviated FH



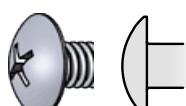
Oval

A countersunk head with a rounded top.
Abbreviated OH or OV



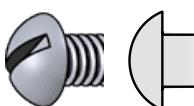
Pan

A slightly rounded head with short vertical sides.
Abbreviated PN



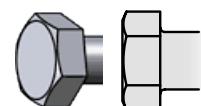
Truss

An extra wide head with a rounded top.



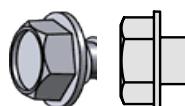
Round

A domed head.
Abbreviated RH



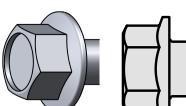
Hex

A hexagonal head
Abbreviated HH or HX



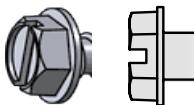
Hex Washer

A hex head with built in washer.



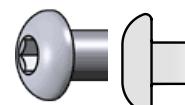
Hex Flange

A hex head with built in flange.



Slotted Hex Washer

A hex head with built in washer and a slot.



Button

A low-profile rounded head using a socket drive.



Socket Cap

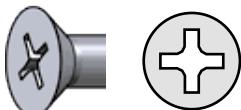
A small cylindrical head using a socket drive.

Fastener Type Chart

www.boltdepot.com/tools

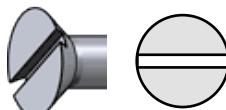
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Drive Types



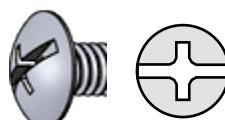
Phillips and Frearson

An X-shaped drive.
Abbreviated PH.



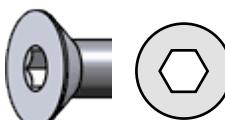
Slotted

A slot in the head.
Abbreviated SL.



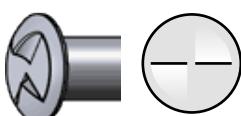
Combination

A combination of slotted and Phillips drives.
Abbreviated combo.



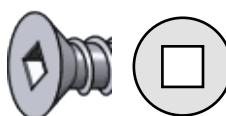
Socket, Hex or Allen

A hexagonal hole for use with an Allen wrench.



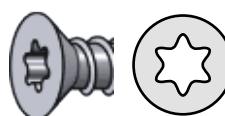
One Way

Installs with a normal slotted driver but can not be removed without special tools.



Square

Also known as Robertson drive.
Abbreviated SQ or SD.



Star

A six-pointed star pattern, specifically designed to prevent cam-out and stripped heads.

Washer Types



Flat

A flat washer, used to distribute load. Available in SAE, USS and other patterns.



Fender

An oversize flat washer used to further distribute load especially on soft materials.



Finishing

A washer used to obtain a 'finished' look. Usually used with oval head screws.



Split Lock

The most common style of washer used to prevent nuts and bolts from backing out.



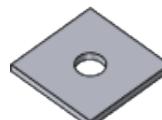
External Tooth Lock

A washer with external 'teeth'. Used to prevent nuts and bolts from backing out.



Internal Tooth Lock

A washer with internal 'teeth'. Used to prevent nuts and bolts from backing out.



Square

A square shaped washer.



Dock

Dock washers have a larger outside diameter and are thicker than standard.



Ogee

Thick, large diameter, cast iron washers with a curved or sculpted appearance. Typically used in dock and wood construction.

Fastener Type Chart

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Nut Types



Hex

A six sided nut. Also referred to as a Finished Hex Nut.



Heavy Hex

A heavier pattern version of a standard hex nut.



Nylon Insert Lock

A nut with a nylon insert to prevent backing off. Also referred to as a Nylock.



Jam

A hex nut with a reduced height.



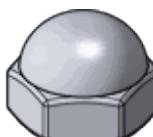
Nylon Insert Jam Lock

A nylock nut with a reduced height.



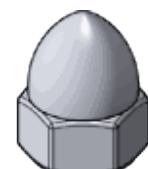
Wing

A nut with 'wings' for hand tightening.



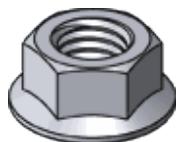
Cap

A nut with a domed top over the end of the fastener.



Acorn

Acorn nuts are a high crown type of cap nut, used for appearance.



Flange

A nut with a built in washer like flange.



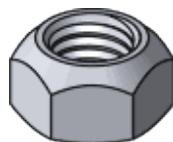
Tee

A nut designed to be driven into wood to create a threaded hole.



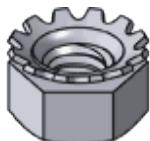
Square

A four sided nut.



Prevailing Torque Lock

A non-reversible lock nut used for high temperature applications.



K-Lock or Kep

A nut with an attached free-spinning external tooth lock washer.



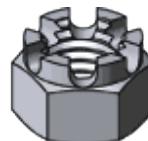
Coupling

Coupling nuts are long nuts used to connect pieces of threaded rod or other male fasteners.



Slotted

Slotted nuts are used in conjunction with a cotter pin on drilled shank fasteners to prevent loosening.



Castle

Castle nuts are used in conjunction with a cotter pin on drilled shank fasteners to prevent loosening.



Pin Lock

A nut that does not require an high installation torque and can be installed and removed without thread damage.

Fastener Type Chart

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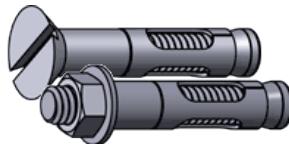
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Anchoring Products



Stud Anchors

A.k.a. Wedge Anchors. One piece expansion bolts for heavy duty fastening into stone or solid concrete.



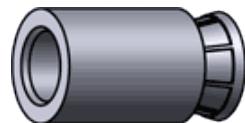
Sleeve Anchors

Heavy duty masonry anchors. Does not require a solid base material for installation.



Lag Shields

Medium duty anchors for use in concrete, brick or mortar. Use with a lag bolt.



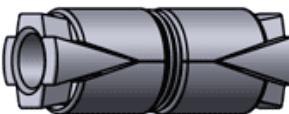
Machine Screw Anchors

A two-piece machine thread anchor for use in stone, brick, or concrete.



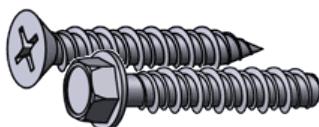
Drop-in Anchors

A heavy duty machine thread anchor for concrete or stone.



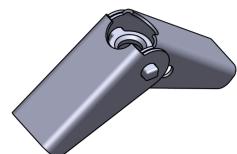
Double Expansion Sleeves

Expansion anchor for masonry that ensures contact along the length of the hole.



Concrete Screws

Used in concrete, brick or block. A quick and easy way to fasten in light to medium duty applications



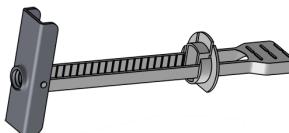
Spring Toggle Wings

Non-removable fasteners that expand behind the material, e.g. inside a wall, for a secure grip.



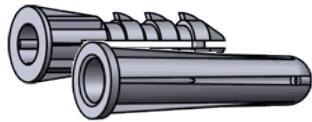
Plastic Toggle

When these anchors are driven in they expand inside the hole for a secure grip. Drill hole the same size as the anchor. Non-removable.



Kaptoggle®

A non removable anchor commonly used for hollow spaces such as drywall and masonry block.



Conical Anchors

Plastic anchors used with sheet metal screws. Can be used in most materials.



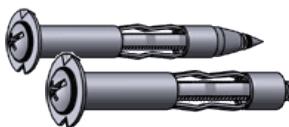
Self Drilling Drywall Anchors

Quick-install plastic anchors used in drywall with sheet metal screws.



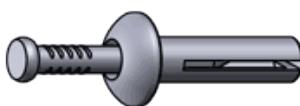
Wood Screw Anchors

This anchor is made of lead and can be used with wood screws or sheet metal screws.



Hollow Wall Anchors

A.k.a. Molly Bolts. Used for light duty anchoring in drywall or other hollow walls.



Nail Drive Anchors

Non removable anchors that expand inside the hole when the nail like pin is driven.



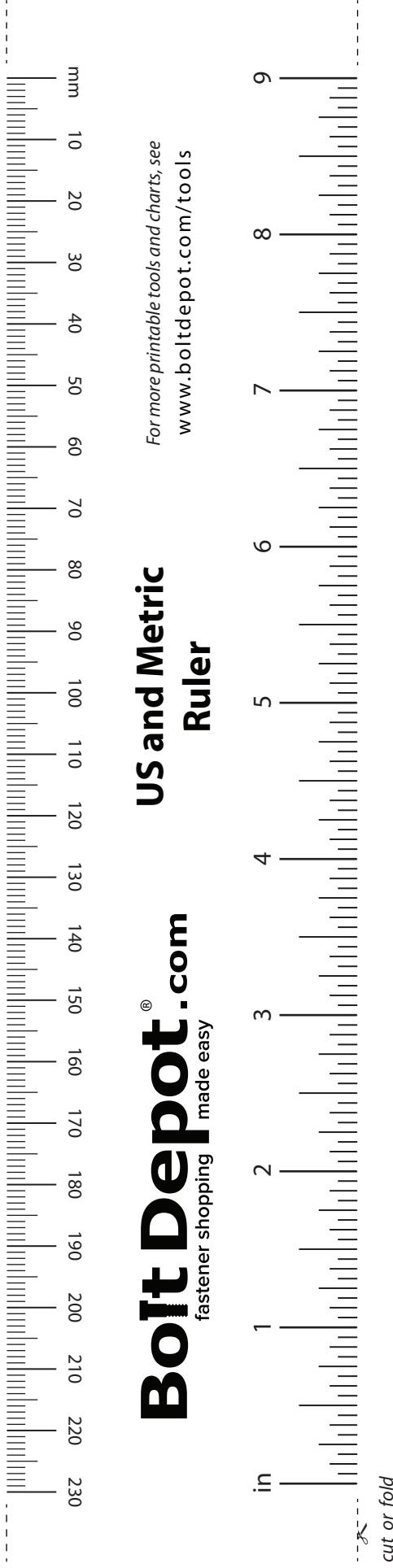
Anchor Bolts

L shaped, machine threaded anchors. Typically embedded in concrete when it is poured.

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US and Metric Ruler

For more printable tools and charts, see
www.boltdepot.com/tools



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IMPORTANT: Make sure to print this chart to **Actual Size** (no scaling).

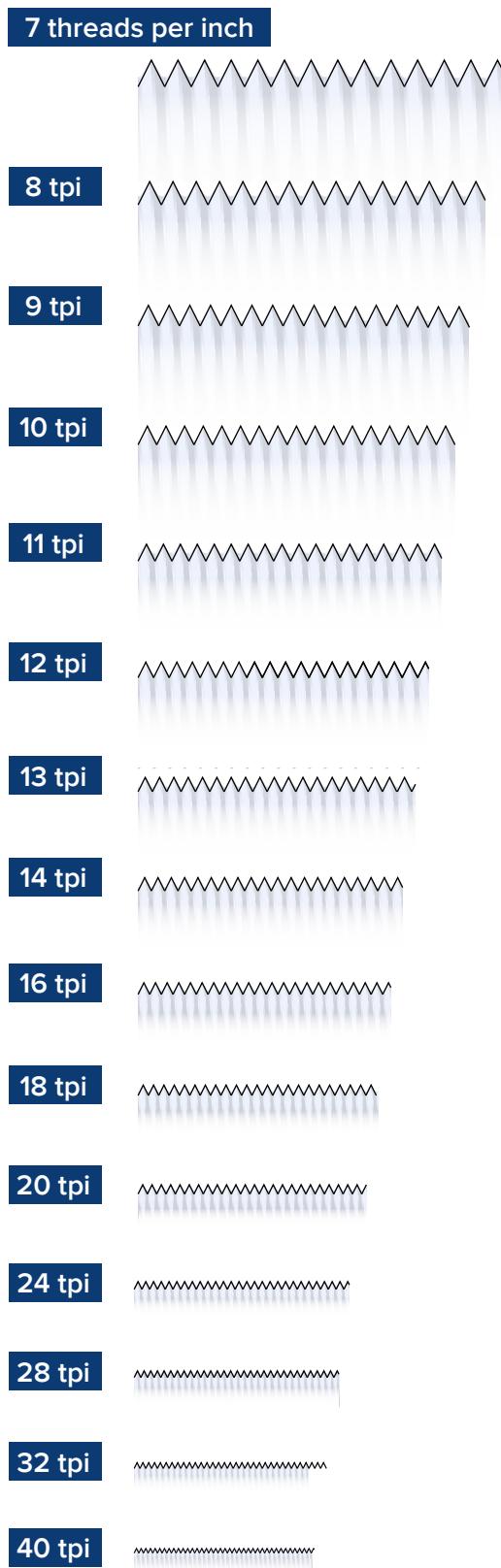
After printing, check the ruler (e.g. against the short side of a letter size paper - 8 1/2 in - or another ruler) to ensure correct scale. See boltdepot.com/tools for more details.

US and Metric Thread Sizes

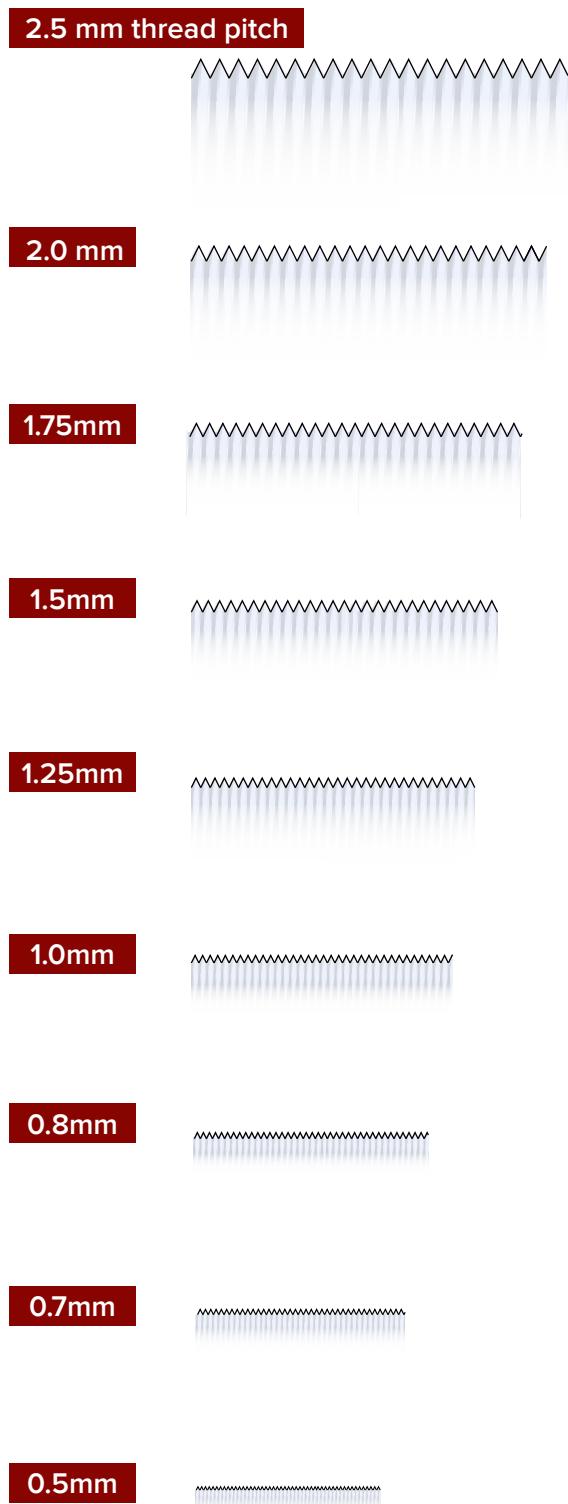
www.boltdepot.com/tools

BoltDepot[®].com

US Thread Sizes



Metric Thread Pitches



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After printing, measure the ruler in the margin to ensure correct scale. See boltdepot.com/tools for more details.

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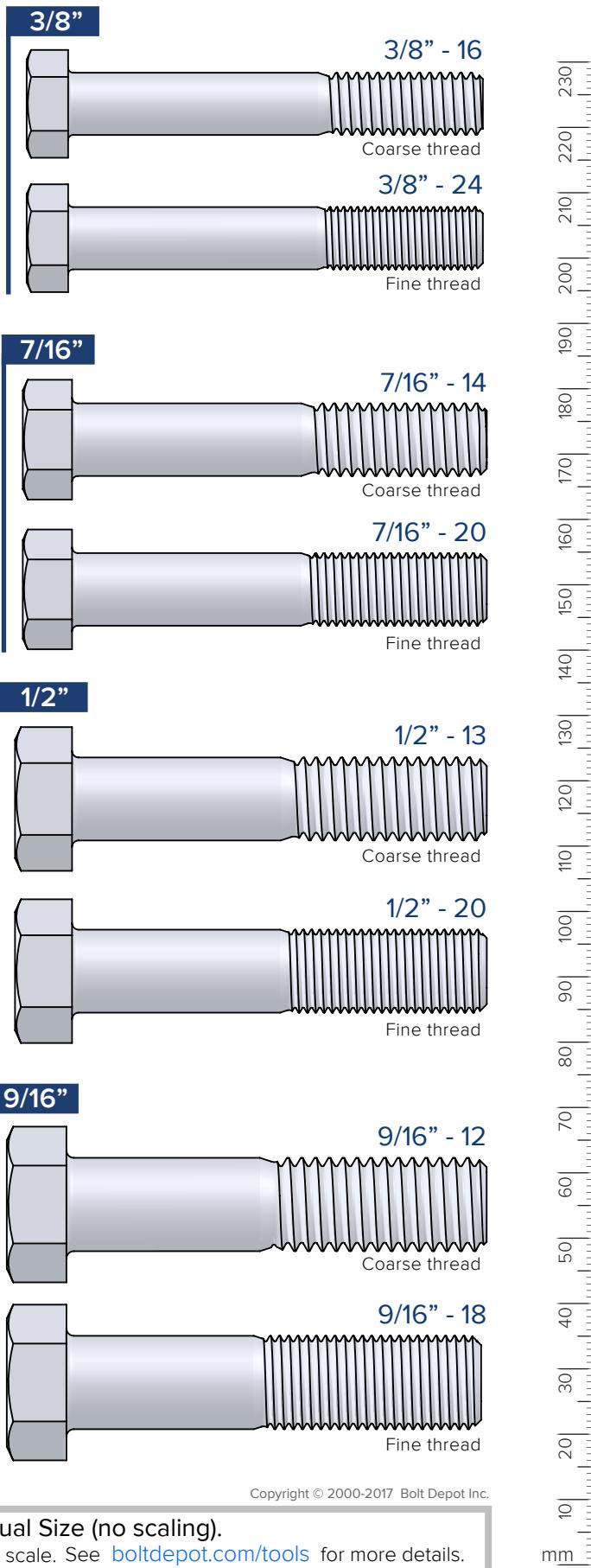
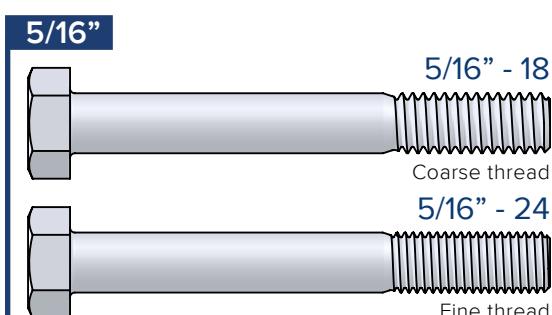
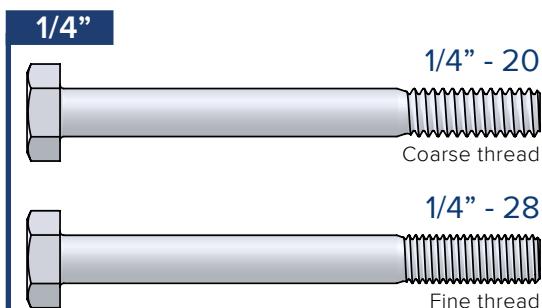
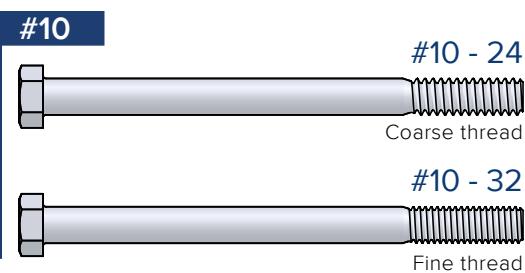
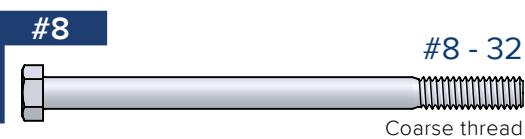
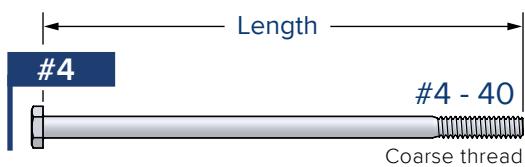
US Hex Bolt Sizes and Thread Pitches

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Length is measured from under the head to the end of the bolt



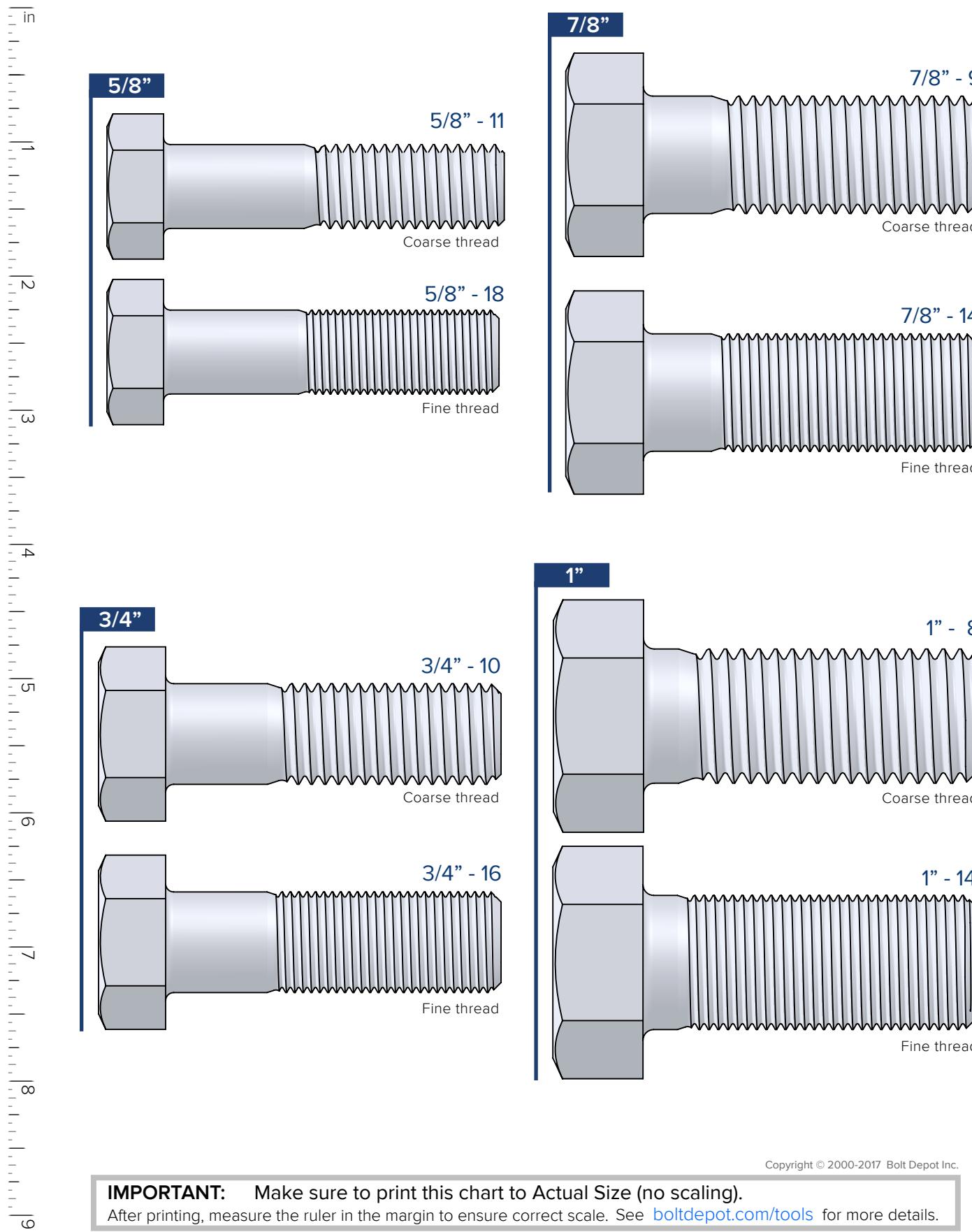
IMPORTANT: Make sure to print this chart to Actual Size (no scaling).

After printing, measure the ruler in the margin to ensure correct scale. See boltdepot.com/tools for more details.

US Hex Bolt Sizes and Thread Pitches (continued)

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IMPORTANT: Make sure to print this chart to Actual Size (no scaling).

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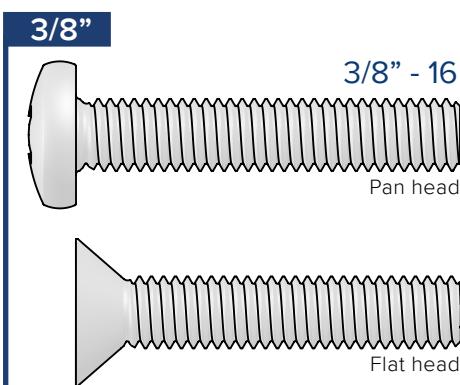
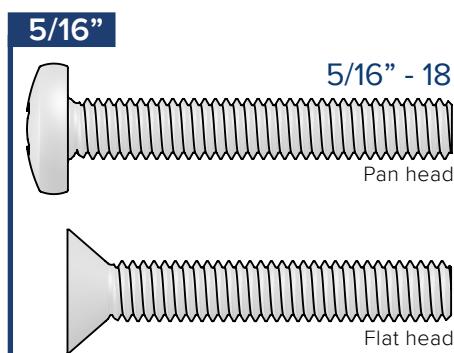
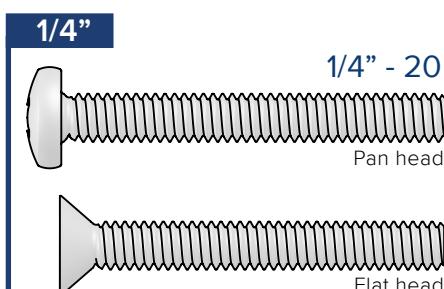
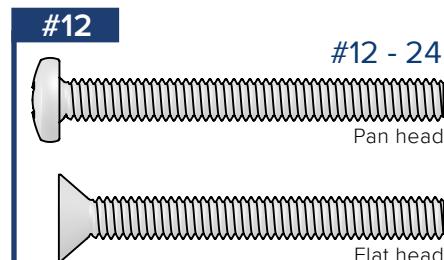
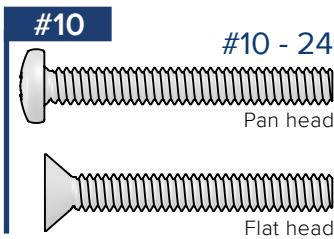
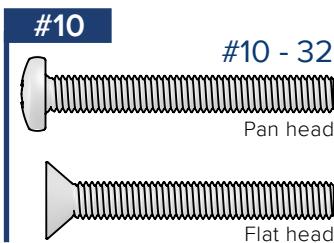
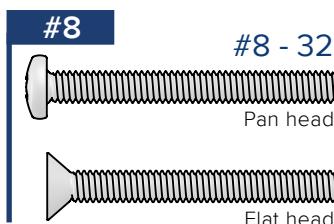
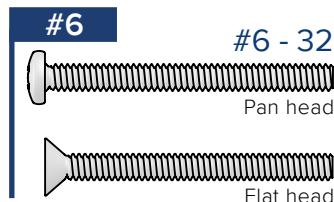
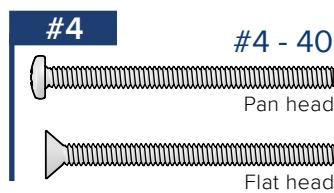
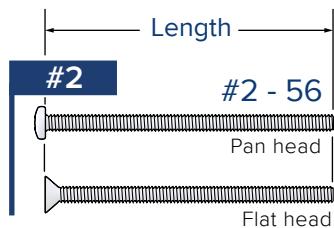
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US Machine Screw Sizes

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Length is measured from where the surface is assumed to be, to the end of the screw. Therefore, pan head screws are measured from under the head, and flat head screws are measured overall.



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After printing, measure the ruler in the margin to ensure correct scale. See boltdepot.com/tools for more details.

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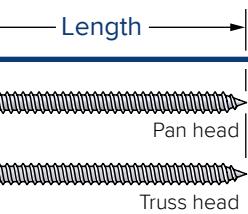
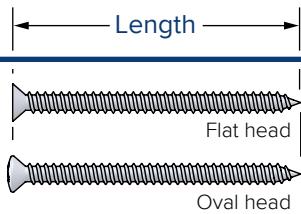
Sheet Metal Screw Sizes

www.boltdepot.com/tools

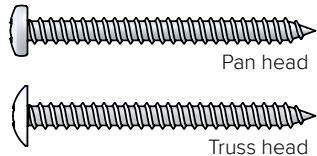
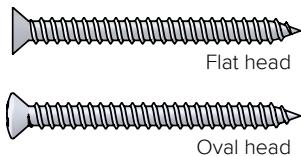
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Fastener length is measured from where the material surface is assumed to be, to the end of the fastener.

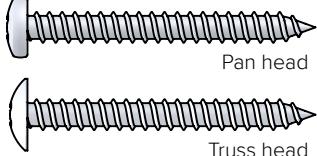
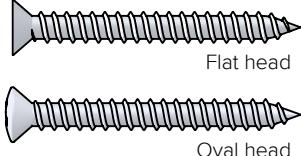
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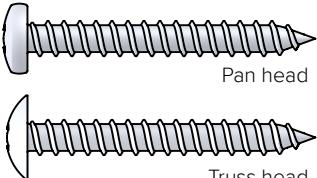
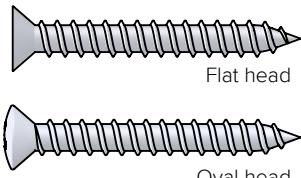
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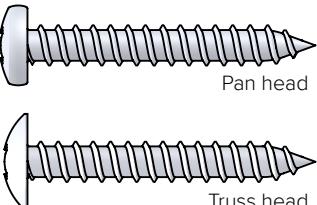
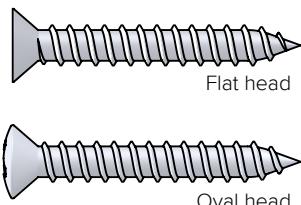
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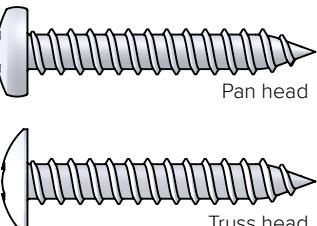
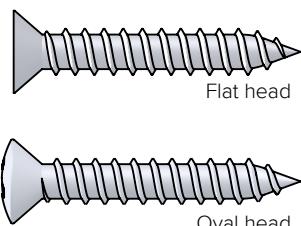
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US Nut Sizes

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www.boltdepot.com/tools

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		Hex	Jam	Nylock	Jam nylock
#0	5/32" wrench			N/A	N/A
#1	5/32" wrench			N/A	N/A
#2	3/16" wrench			N/A	N/A
#3	3/16" wrench			N/A	N/A
#4	1/4" wrench			N/A	N/A
#5	5/16" wrench			N/A	N/A
#6	5/16" wrench			N/A	N/A
#8	11/32" wrench			N/A	N/A
#10	3/8" wrench			N/A	N/A
#12	7/16" wrench			N/A	N/A
1/4"	7/16" wrench				
5/16"	1/2" wrench				
3/8"	9/16" wrench				
7/16"	11/16" wrench				

Note: Hex nuts with a diameter under 1/4" are called hex machine screw nuts

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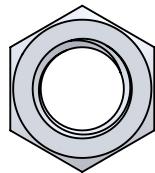
US Nut Sizes (continued)

www.boltdepot.com/tools

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1/2"
3/4" wrench



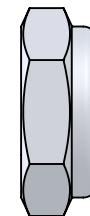
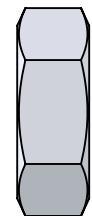
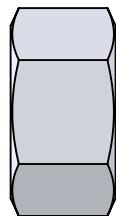
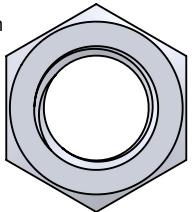
Hex

Jam

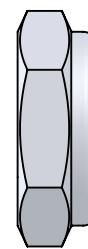
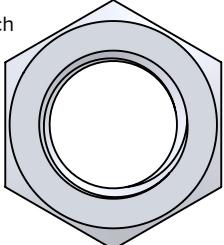
Nylock

Jam
nylock

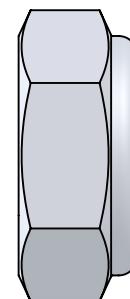
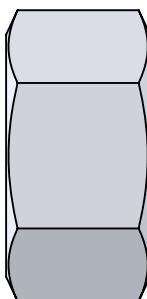
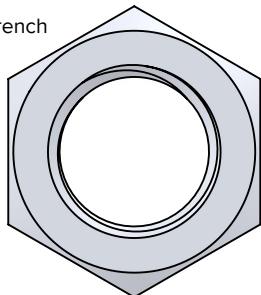
5/8"
15/16" wrench



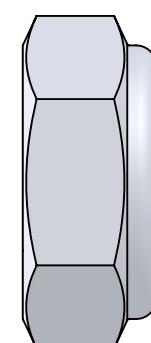
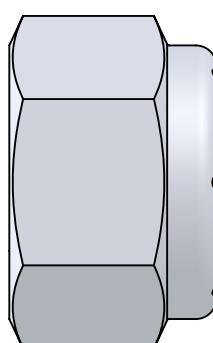
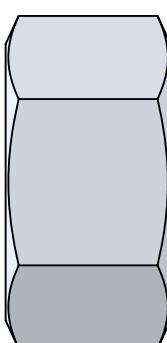
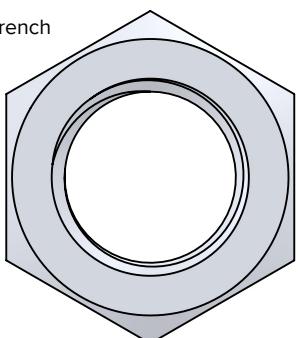
3/4"
1-1/8" wrench



7/8"
1-5/16" wrench



1"
1-1/2" wrench



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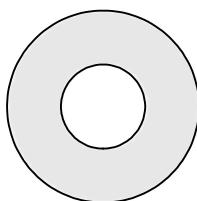
USS Flat Washer Sizes

www.boltdepot.com/tools

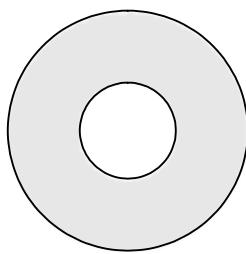
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Washer sizes correspond to the screw/bolt diameter they fit. For example, a 1/2" washer fits a 1/2" bolt, and therefore has an inner diameter of just over 1/2".

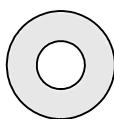
3/8"



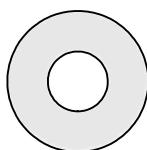
7/16"



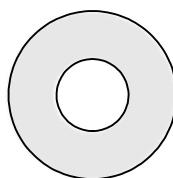
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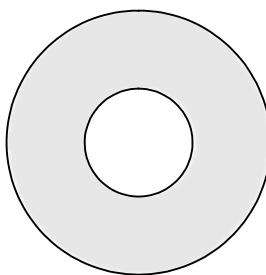
1/4"



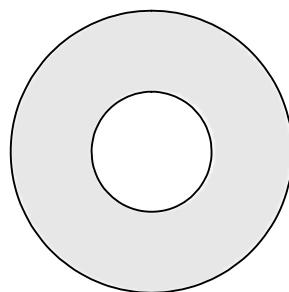
5/16"



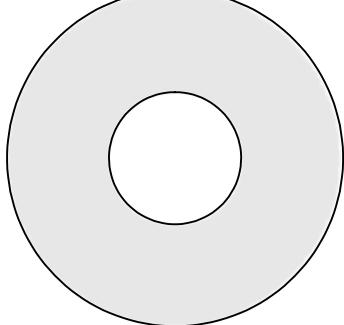
1/2"



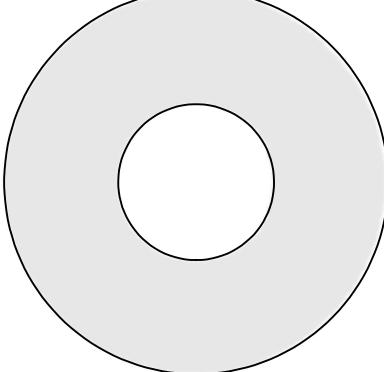
9/16"



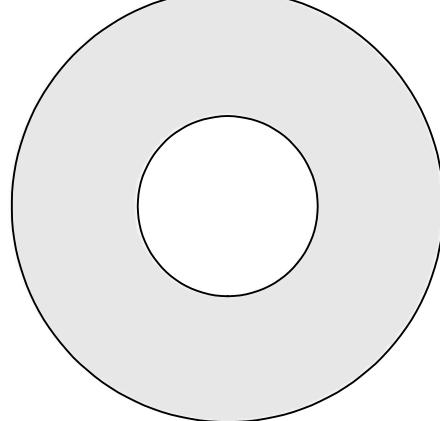
5/8"



3/4"



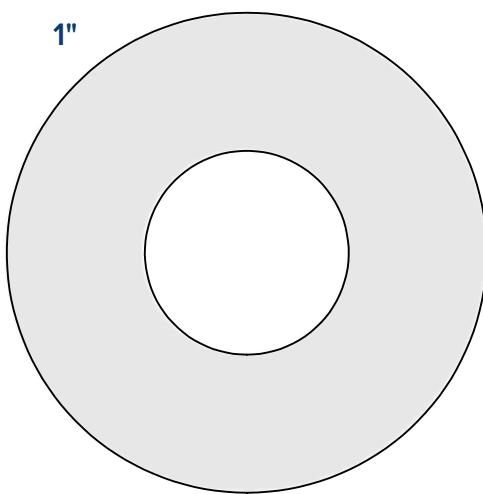
7/8"



Large USS Washer Sizes

Size	Diameter	
	Inside	Outside
1-1/8"	1-1/4"	2-3/4"
1-1/4"	1-3/8"	3"
1-3/8"	1-1/2"	3-1/4"
1-1/2"	1-5/8"	3-1/2"
1-5/8"	1-3/4"	3-3/4"
1-3/4"	1-7/8"	4"
2"	2-1/8"	4-1/2"

1"



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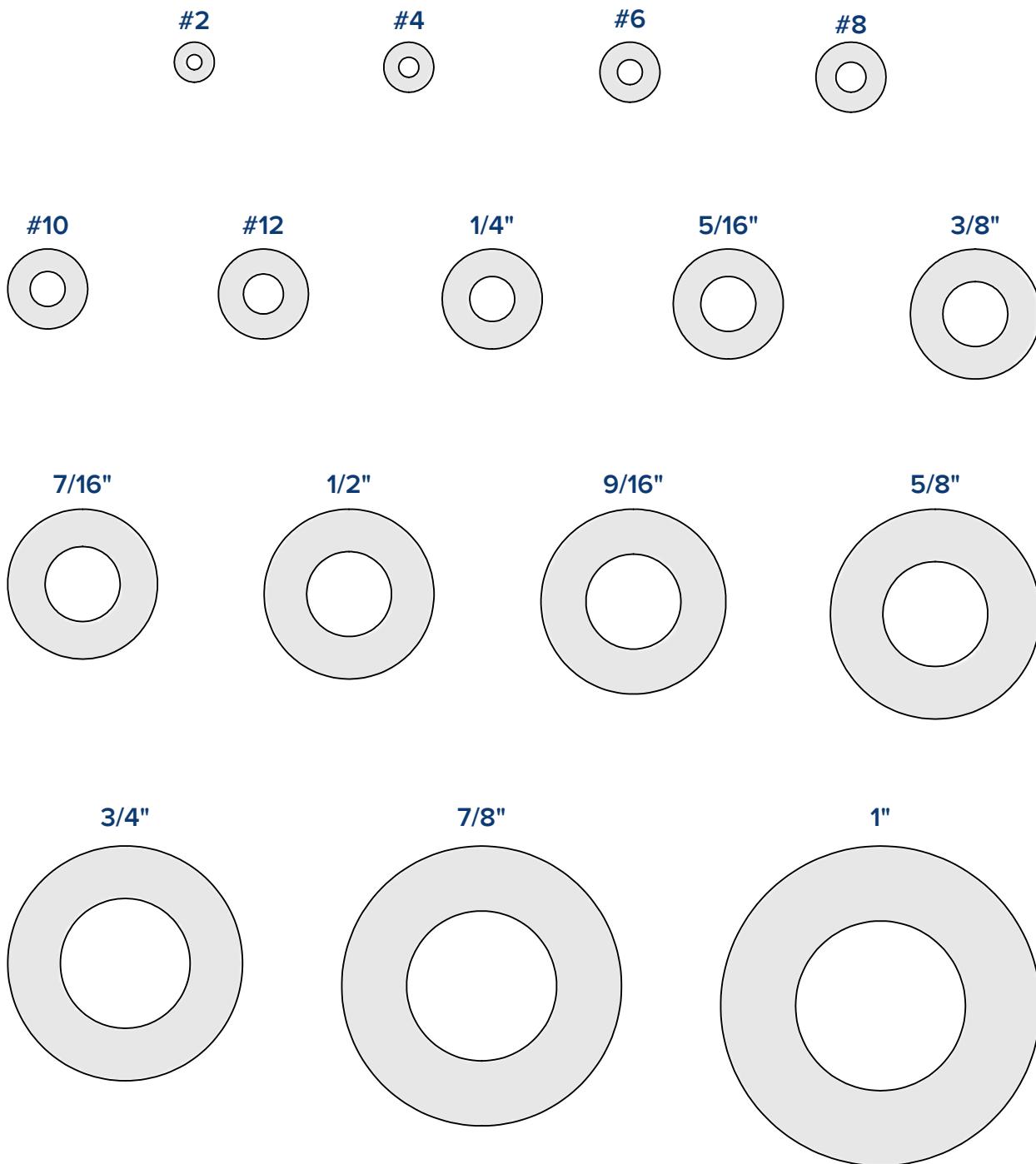
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22 | 550
23 | 575
24 | 600
25 | 625
26 | 650
27 | 675
28 | 700
29 | 725
30 | 750
31 | 775
32 | 800
33 | 825
34 | 850
35 | 875
36 | 900
37 | 925
38 | 950
39 | 975
40 | 1000
41 | 1025
42 | 1050
43 | 1075
44 | 1100
45 | 1125
46 | 1150
47 | 1175
48 | 1200
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54 | 1350
55 | 1375
56 | 1400
57 | 1425
58 | 1450
59 | 1475
60 | 1500
61 | 1525
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64 | 1600
65 | 1625
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67 | 1675
68 | 1700
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71 | 1775
72 | 1800
73 | 1825
74 | 1850
75 | 1875
76 | 1900
77 | 1925
78 | 1950
79 | 1975
80 | 2000
81 | 2025
82 | 2050
83 | 2075
84 | 2100
85 | 2125
86 | 2150
87 | 2175
88 | 2200
89 | 2225
90 | 2250
91 | 2275
92 | 2300

SAE Flat Washer Sizes

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Washer sizes correspond to the screw/bolt diameter they fit. For example, an 1/4" washer fits an 1/4" bolt, and therefore has an inner diameter of just over 1/4".



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mm 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230

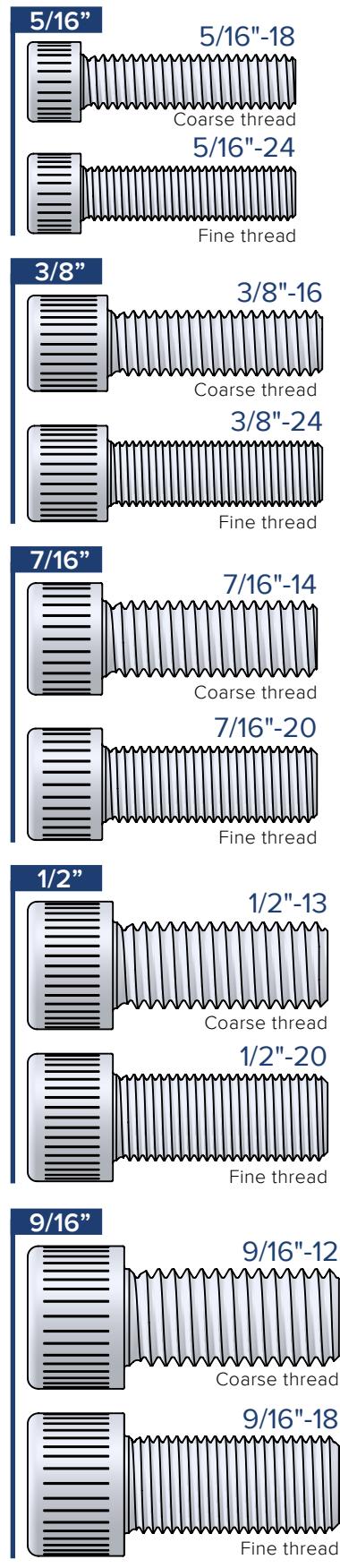
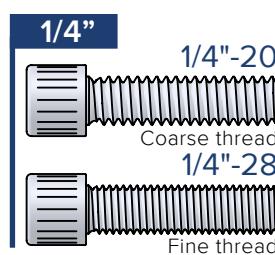
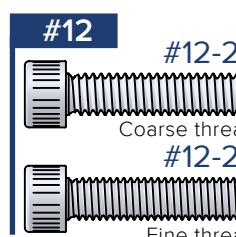
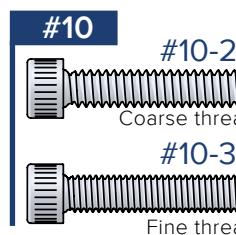
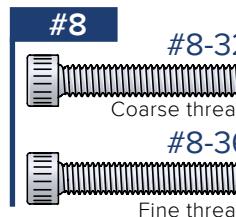
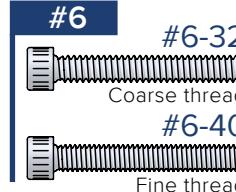
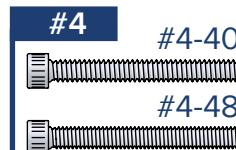
US Socket Cap Sizes

www.boltdepot.com/tools

Bolt Depot® fastener shopping made easy BoltDepot.com

Fastener length is measured from where the material surface is assumed to be, to the end of the fastener.

Length



IMPORTANT: Make sure to print this chart to Actual Size (no scaling).

After printing, measure the ruler in the margin to ensure correct scale. See boltdepot.com/tools for more details.

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US Socket Cap Sizes (continued)

www.boltdepot.com/tools

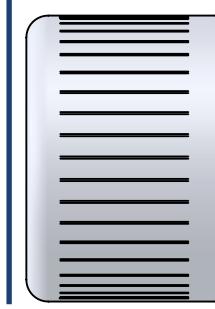
Bolt Depot®
fastener shopping made easy

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1"-8
Coarse thread



1"-14
Fine thread



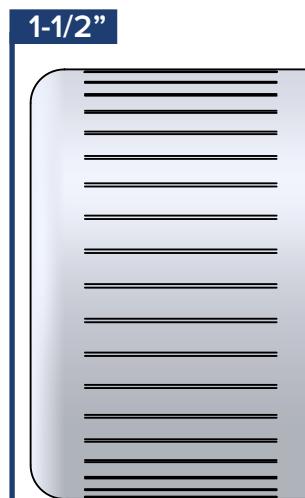
1-1/8"-7
Coarse thread



1-1/4"-7
Coarse thread



1-3/8"-6
Coarse thread



1-1/2"-6
Coarse thread

IMPORTANT: Make sure to print this chart to Actual Size (no scaling).

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US Socket Flat Head Sizes

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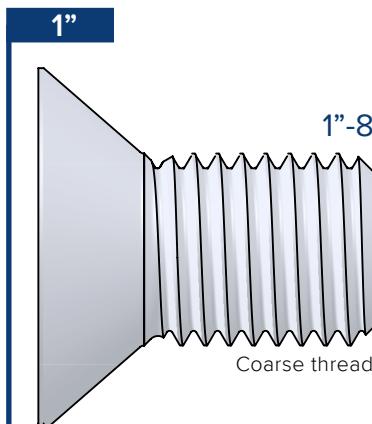
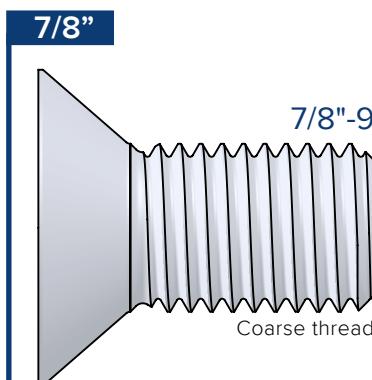
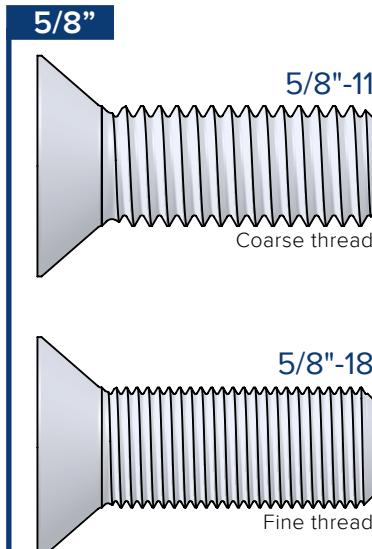
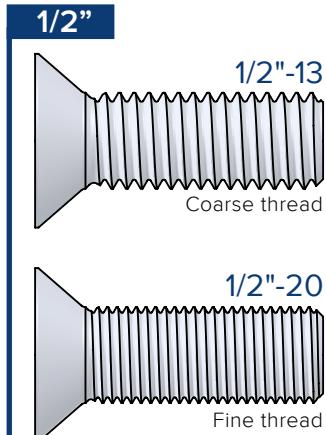
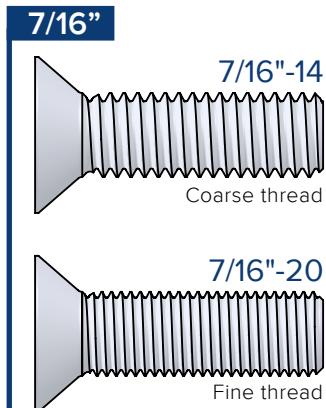
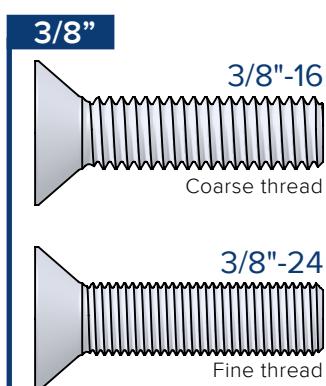
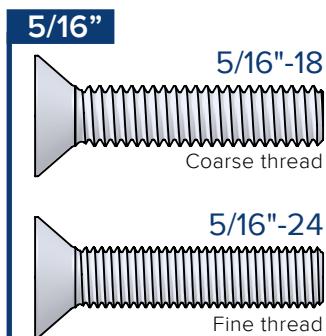
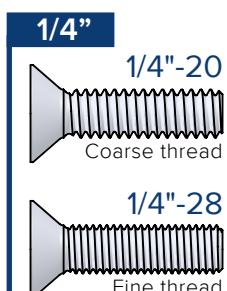
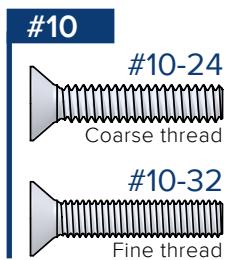
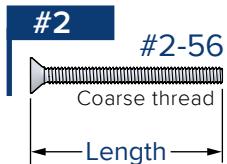
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Fastener length is measured from where the material surface is assumed to be, to the end of the fastener.



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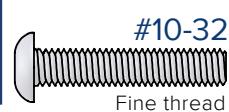
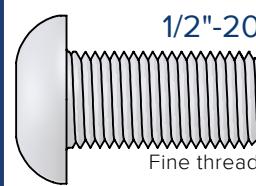
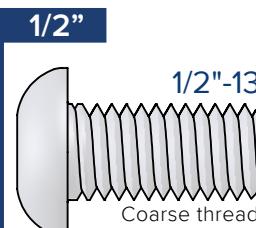
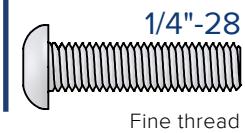
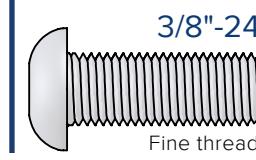
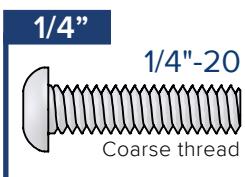
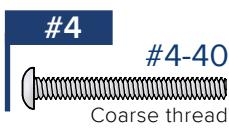
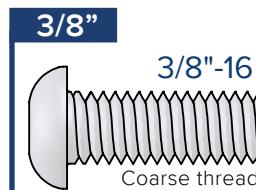
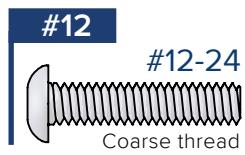
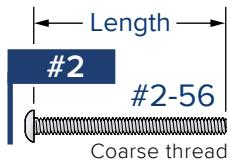
After printing, measure the ruler in the margin to ensure correct scale. See boltdepot.com/tools for more details.

US Socket Button Head Sizes

www.boltdepot.com/tools

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Fastener length is measured from where the material surface is assumed to be, to the end of the fastener.



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25	50	75	100	125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600

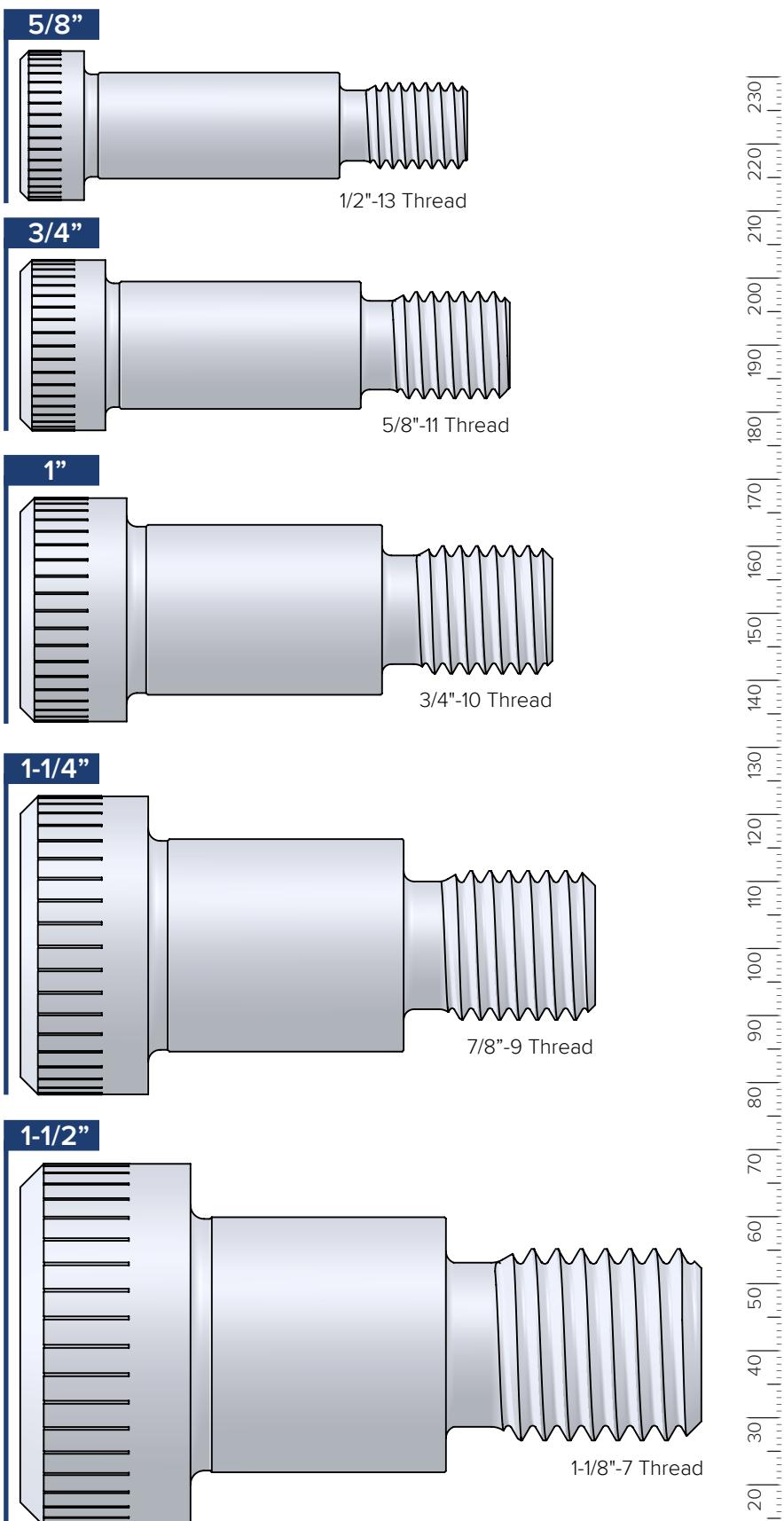
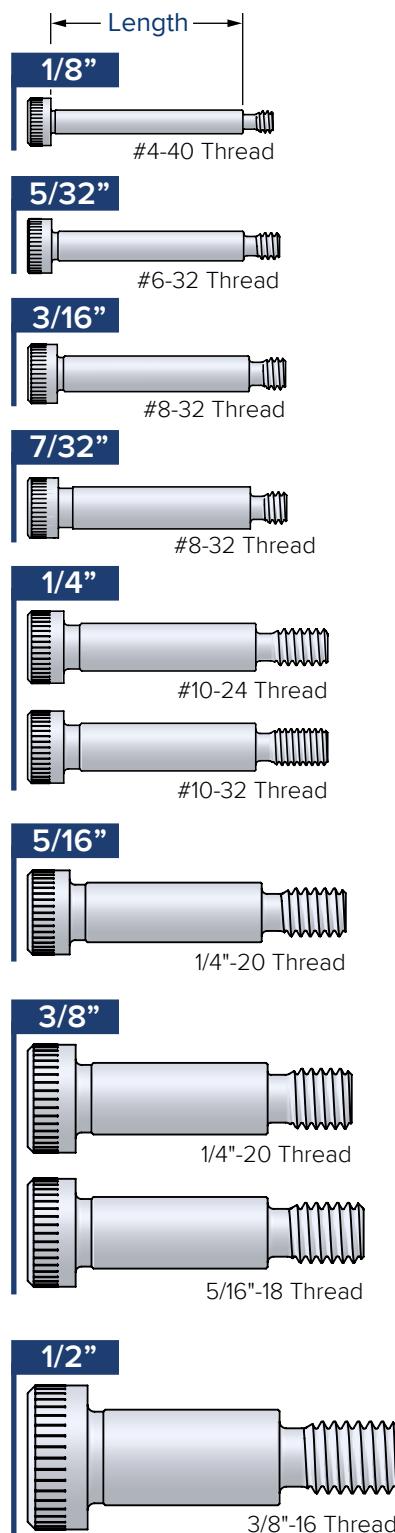
US Shoulder Bolt Sizes

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Shoulder bolt size is determined by the diameter and length of the shoulder.



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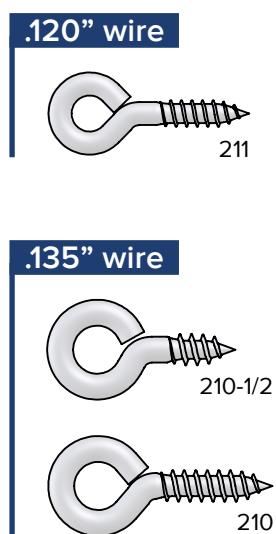
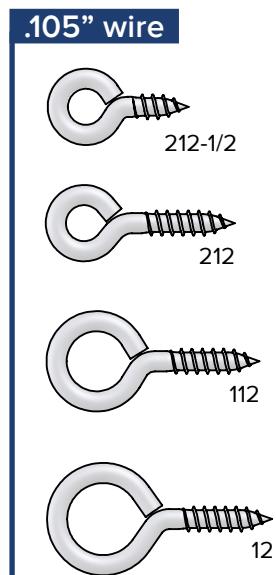
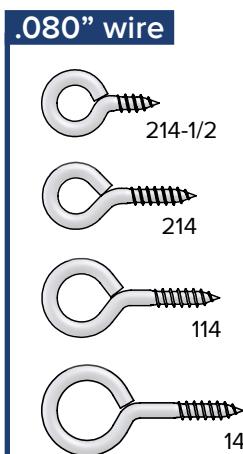
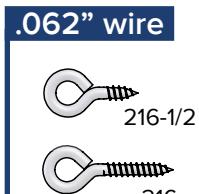
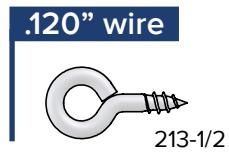
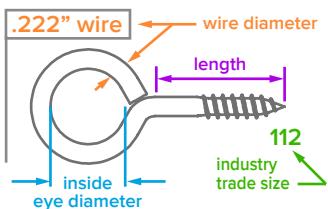
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Screw Eye Sizes

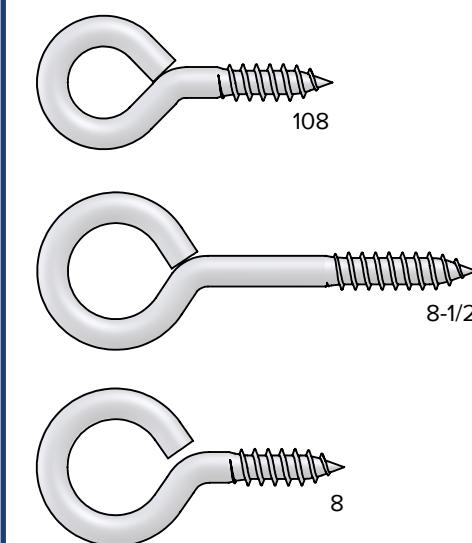
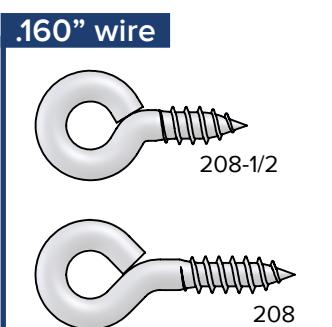
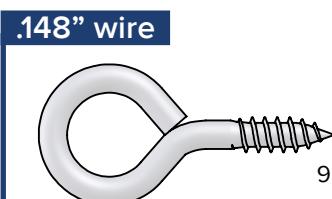
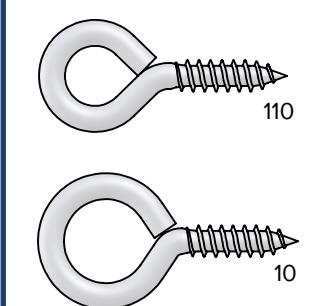
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Screw eyes are sold by industry trade sizes (e.g. 112), which correspond to a specific wire diameter, inside eye diameter and length.



.135" wire continued



IMPORTANT: Make sure to print this chart to Actual Size (no scaling).

After printing, measure the ruler in the margin to ensure correct scale. See boltdepot.com/tools for more details.

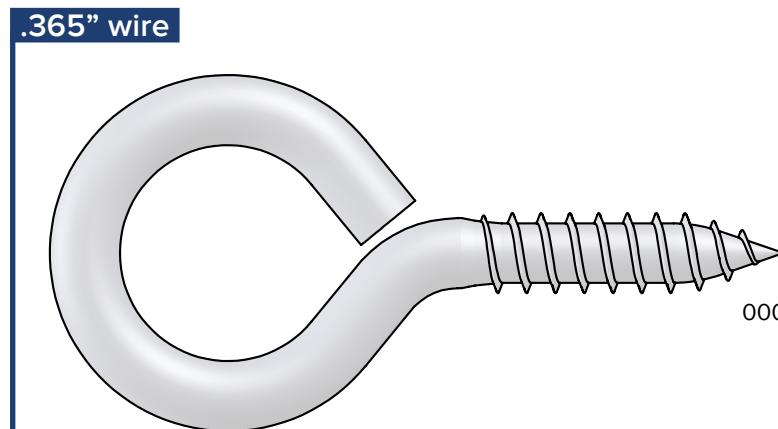
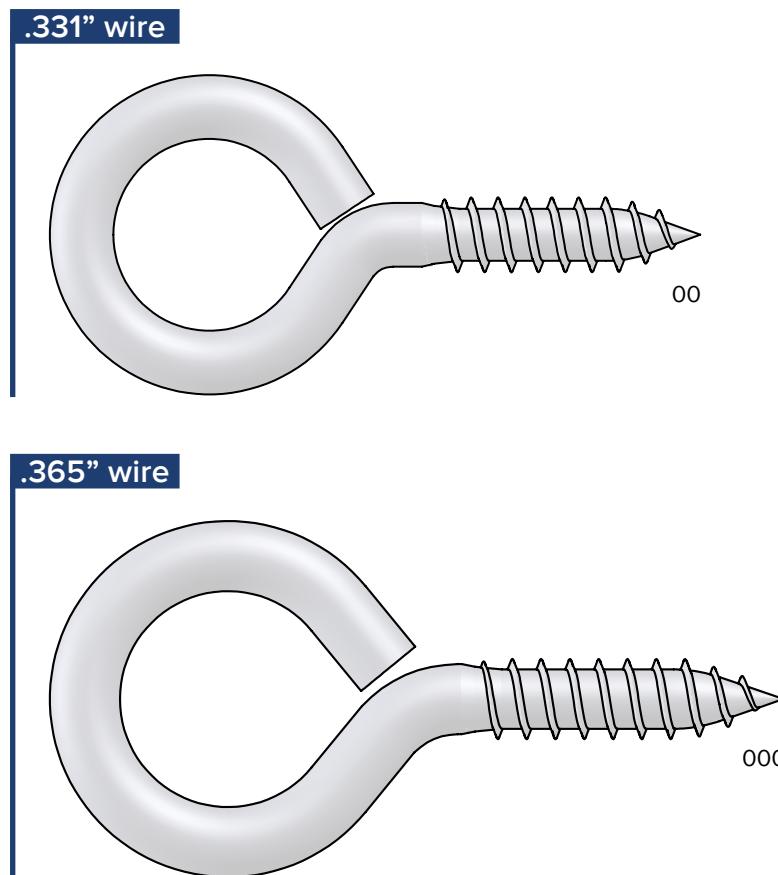
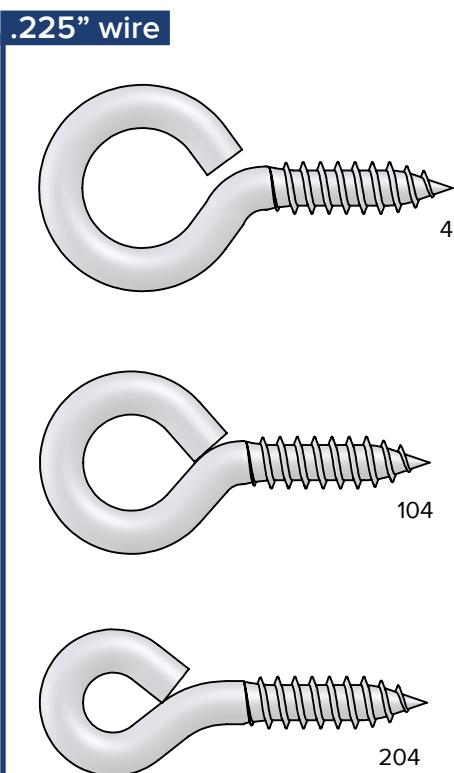
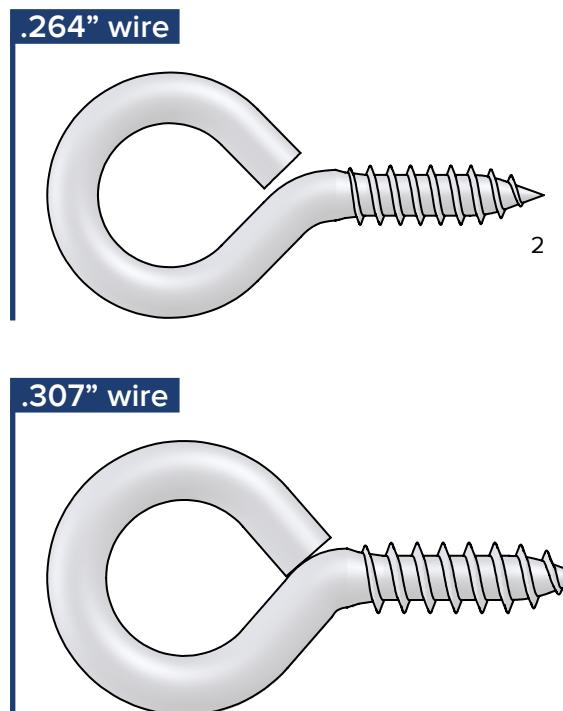
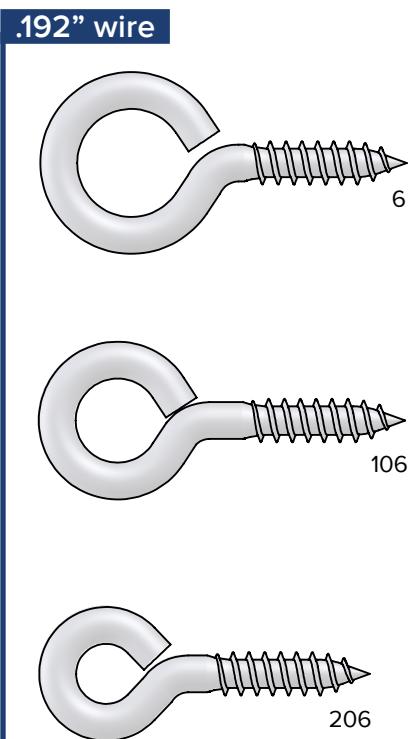
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Screw Eye Sizes (continued)

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Metric Hex Bolt Diameters and Thread Pitches

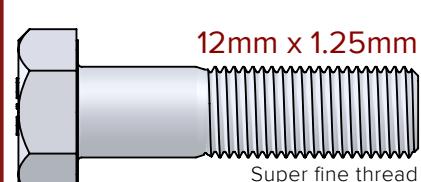
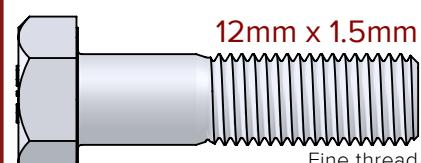
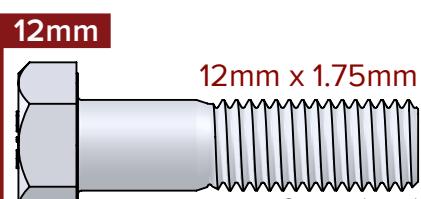
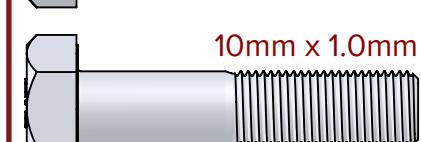
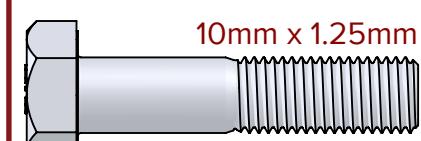
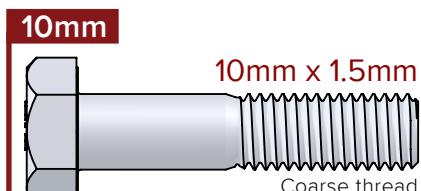
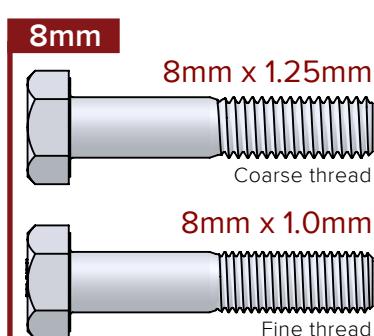
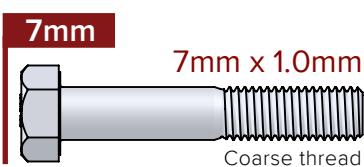
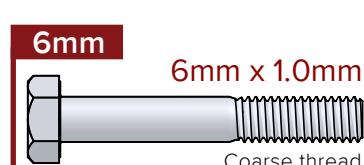
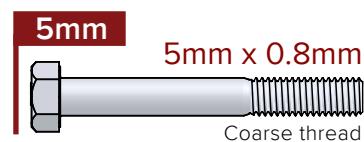
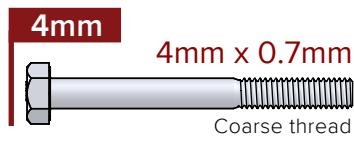
www.boltdepot.com/tools

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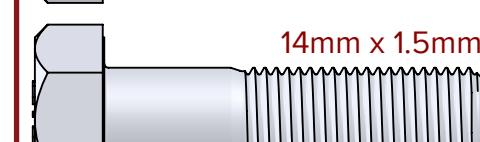
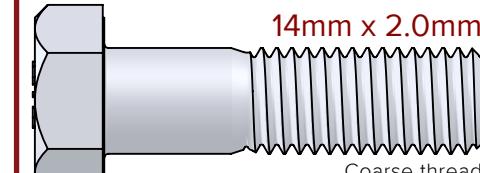
Length is measured from under the head to the end of the bolt

Note: Head sizes may differ from what is shown due to differences between metric standards

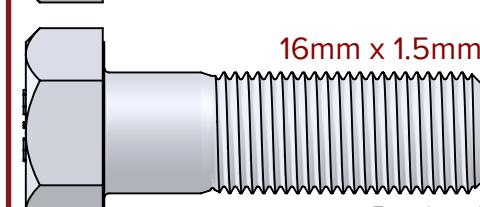
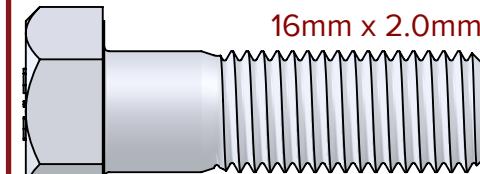
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IMPORTANT: Make sure to print this chart to Actual Size (no scaling).

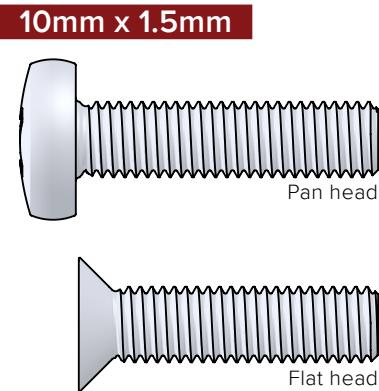
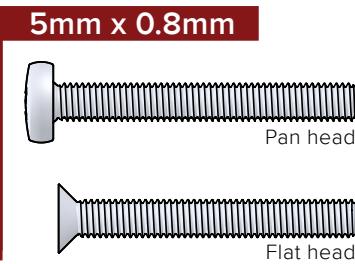
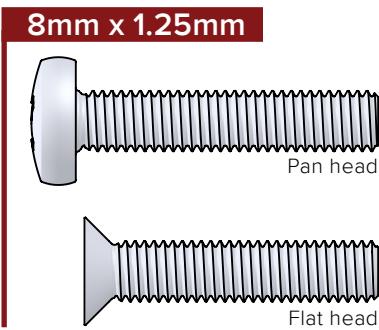
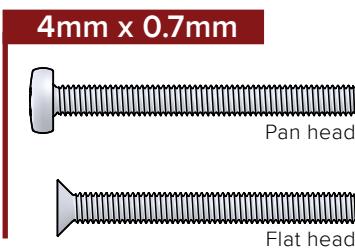
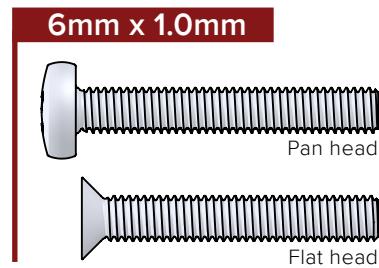
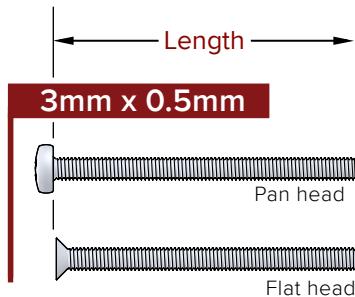
After printing, measure the ruler in the margin to ensure correct scale. See boltdepot.com/tools for more details.

Standard Metric Machine Screw Sizes

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Length is measured from where the surface is assumed to be, to the end of the screw. Therefore, pan head screws are measured from under the head, and flat head screws are measured overall.



IMPORTANT: Make sure to print this chart to Actual Size (no scaling).

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Metric Nut Sizes

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Hex Jam Nylock

2mm

4mm wrench



N/A

2.5mm

5mm wrench



N/A

3mm

5.5mm wrench



4mm

7mm wrench



5mm

8mm wrench



6mm

10mm wrench



7mm

11mm wrench



N/A

8mm

13mm wrench



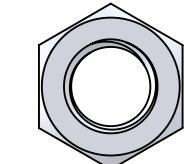
10mm

17mm wrench

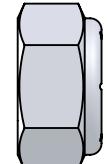
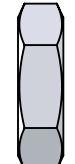


12mm

19mm wrench

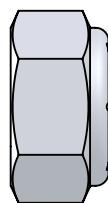
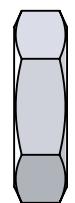
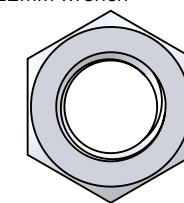


Hex Jam Nylock



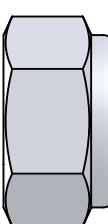
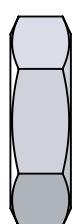
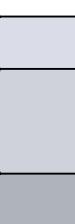
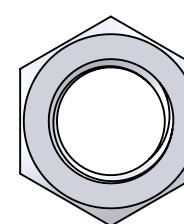
14mm

22mm wrench



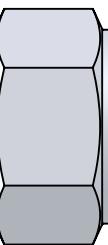
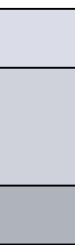
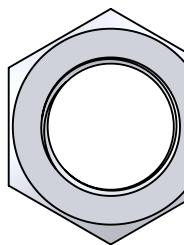
16mm

24mm wrench



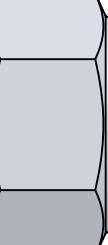
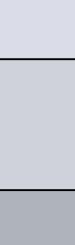
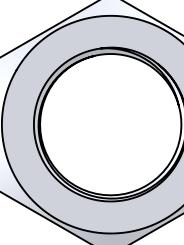
18mm

27mm wrench



20mm

30mm wrench



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After printing, measure the ruler in the margin to ensure correct scale. See boltdepot.com/tools for more details.

mm | in

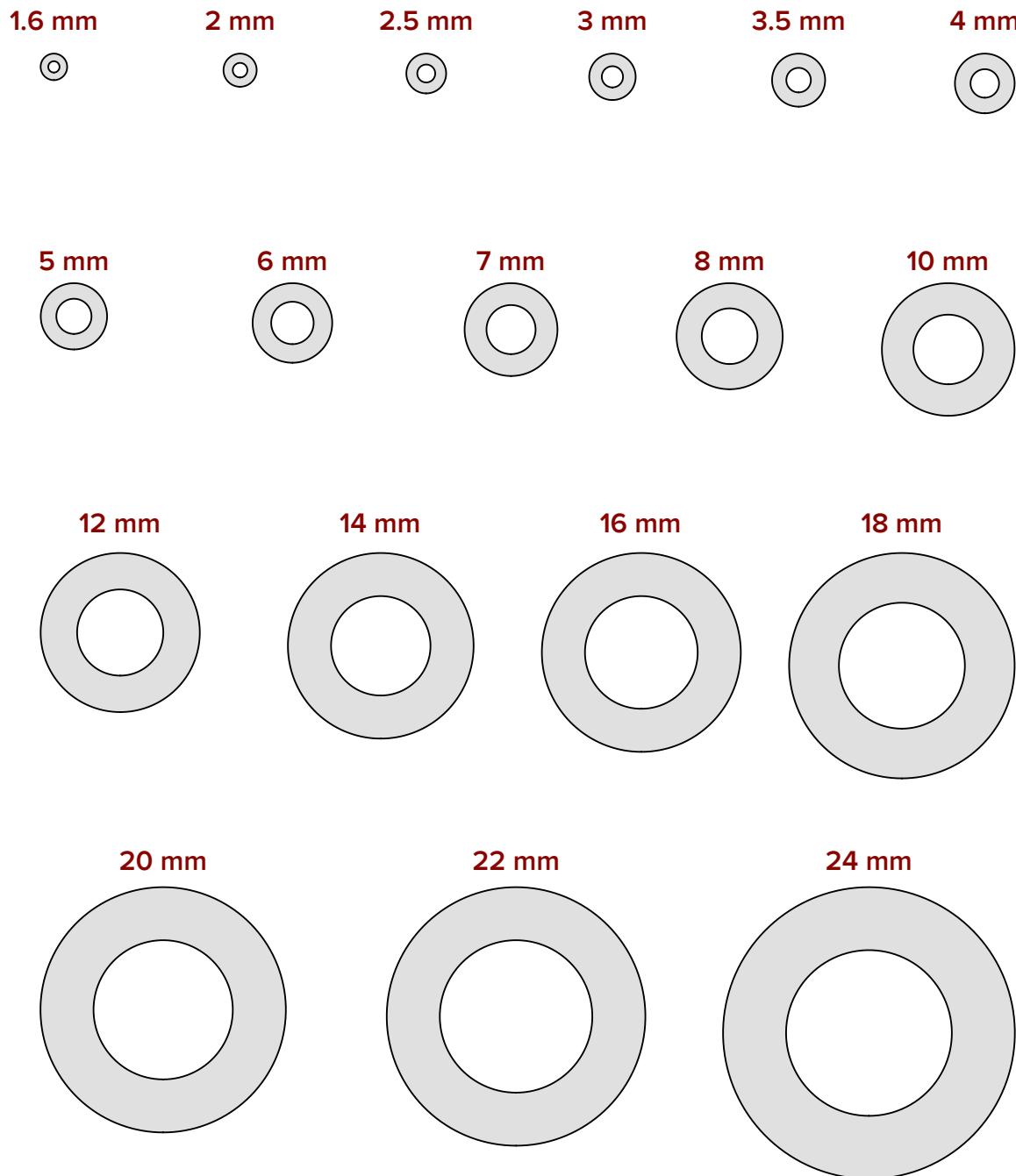
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100 | 10 | 100
110 | 11 | 110
120 | 12 | 120
130 | 13 | 130
140 | 14 | 140
150 | 15 | 150
160 | 16 | 160
170 | 17 | 170
180 | 18 | 180
190 | 19 | 190
200 | 20 | 200
210 | 21 | 210
220 | 22 | 220
230 | 23 | 230

Metric Flat Washer Sizes

www.boltdepot.com/tools

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Washer sizes correspond to the screw/bolt diameter they fit. For example, an 8mm washer fits an 8mm bolt, and therefore has an inner diameter of just over 8mm.



IMPORTANT: Make sure to print this chart to Actual Size (no scaling).

After printing, measure the ruler in the margin to ensure correct scale. See boltdepot.com/tools for more details.

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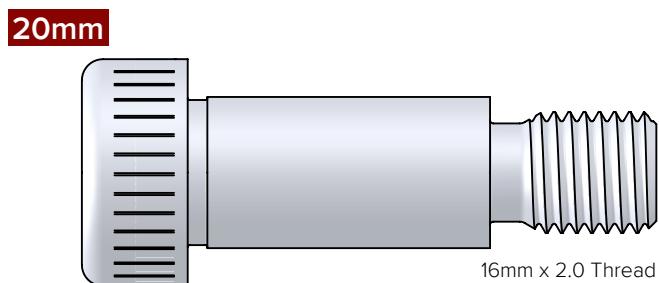
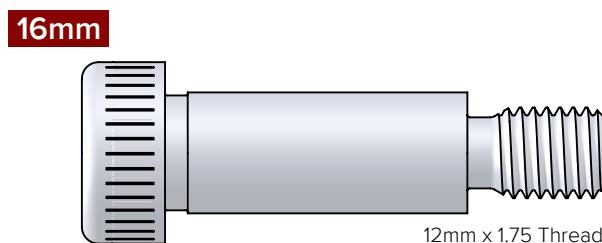
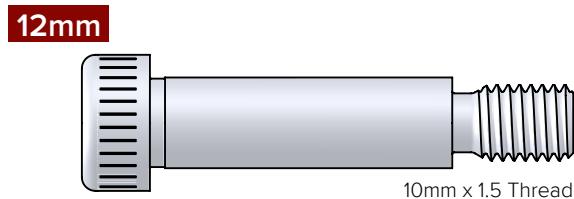
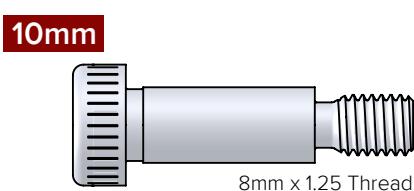
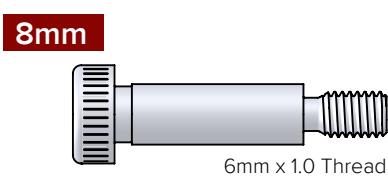
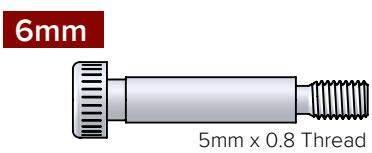
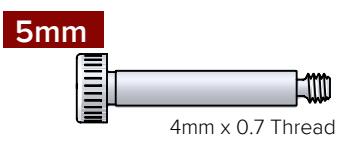
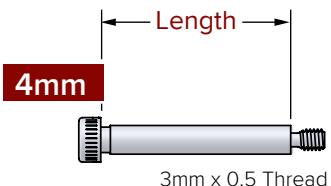
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Metric Shoulder Bolt Sizes

www.boltdepot.com/tools

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fastener shopping made easy

Shoulder bolt size is determined by the diameter and length of the shoulder.



IMPORTANT: Make sure to print this chart to Actual Size (no scaling). After printing, measure the ruler in the margin to ensure correct scale. See boltdepot.com/tools for more details.

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in | mm

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31 | 310
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33 | 330
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36 | 360
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38 | 380
39 | 390
40 | 400
41 | 410
42 | 420
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60 | 600
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Metric Socket Cap Sizes

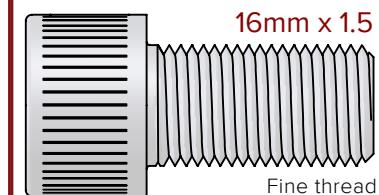
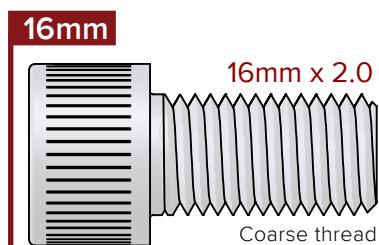
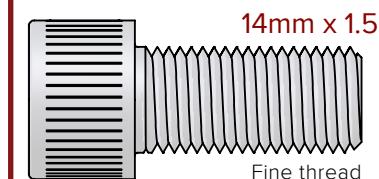
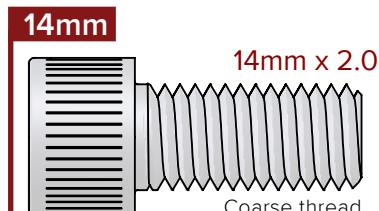
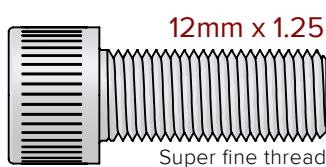
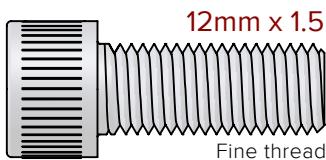
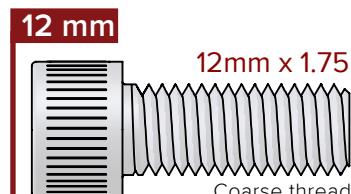
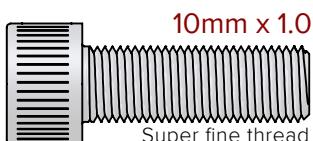
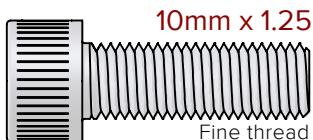
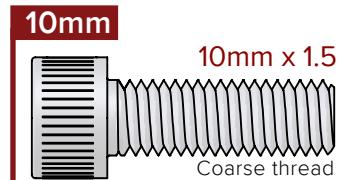
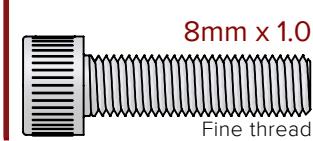
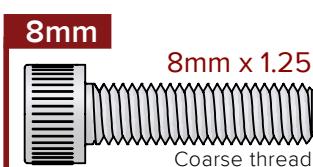
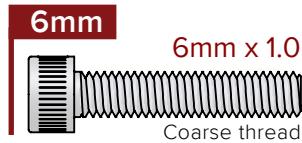
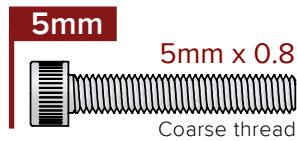
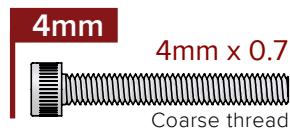
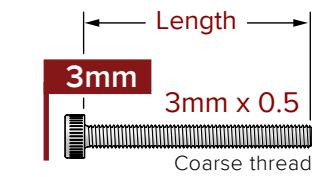
www.boltdepot.com/tools

Fastener length is measured from where the material surface is assumed to be, to the end of the fastener.

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IMPORTANT: Make sure to print this chart to Actual Size (no scaling).

After printing, measure the ruler in the margin to ensure correct scale. See boltdepot.com/tools for more details.

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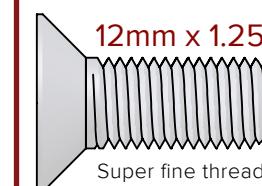
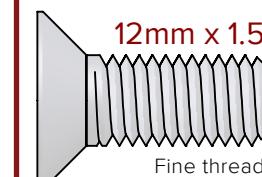
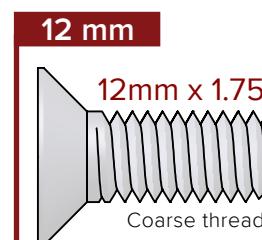
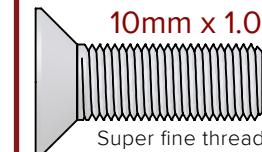
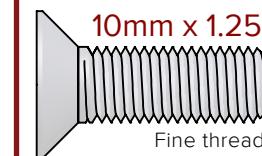
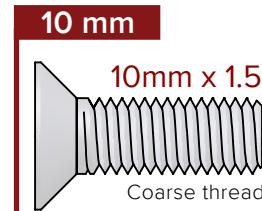
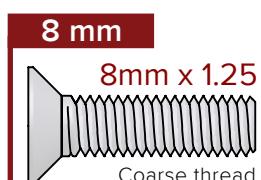
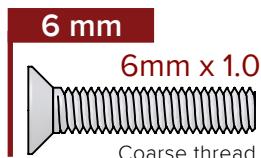
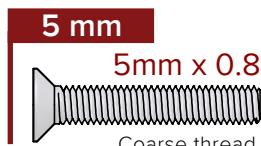
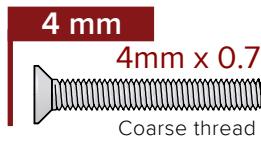
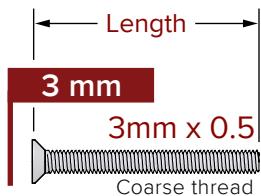
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Metric Socket Flat Head Sizes

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Fastener length is measured from where the material surface is assumed to be, to the end of the fastener.



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After printing, measure the ruler in the margin to ensure correct scale. See boltdepot.com/tools for more details.

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Metric Socket Button Head Sizes

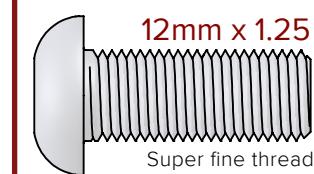
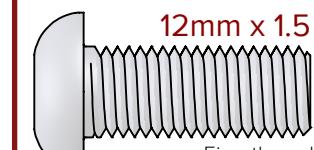
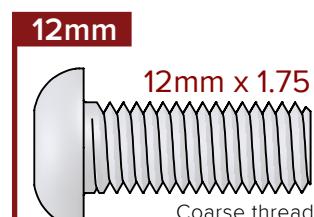
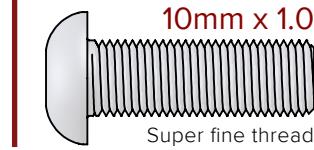
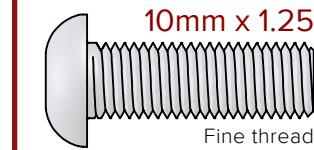
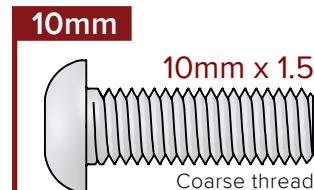
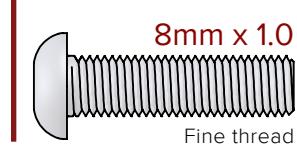
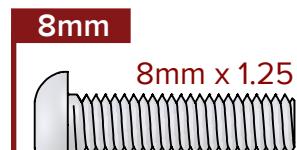
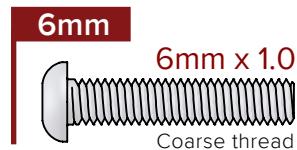
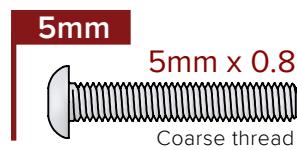
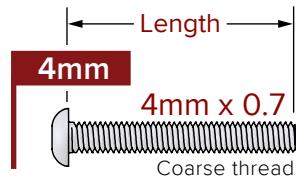
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fastener shopping made easy

Fastener length is measured from where the material surface is assumed to be, to the end of the fastener.

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