FASTENER BASICS

Your quick reference to fastener terminology, measurements, materials and grades.

HOW TO MEASURE A FASTENER?



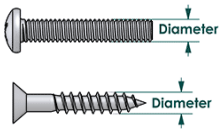
#10-24 X 1 1/2" Pan Phil Machine Screw, Stainless Steel 18-8

- **Diameter**
- **Thread Count (TPI)**
- **Length**
- **Head**
- **Drive**
- **Fastener Type**
- **Material**

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.



Thread Count & Thread Pitch

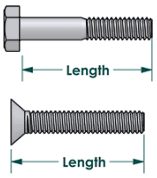
Machine threaded fasteners specify a thread density in **Threads Per Inch** (US) or as a **Thread Pitch** in mm (Metric).

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

Measuring Length

Fastener length is usually measured from where the head contacts the material to the end of the fastener.

Countersunk fasteners are measured overall, while non-countersunk fasteners are measured from under the head.



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.

Drive Types

- **Phillips** and **Slotted** drives are common in screws, but more prone to stripping.
- **Combo** drives can be used with either driver and are available in many fastener types.
- **Hex Socket (Allen)** drives are compact and easy to drive, but can also strip under high torque.
- **Star (Torx™)** and **Square** drive are resistant to stripping and are easier to install one-handed.

Need help selecting the right fastener? Our team is here to help.
(305) 400-8210 | sales@primefast.com

GRADES & CLASSES

Fastener Grade (US) or **Class (Metric)** indicates a fastener's **strength** and **mechanical properties**. Choose the appropriate grade based on your application's strength requirements.

GRADE	HEAD MARKING	STRENGTH LEVEL	APPLICATIONS
SAE GRADES (INCH)			
SAE Grade 2		LOW STRENGTH	General Purpose • Indoor projects • Light equipment • Low strength requirements
SAE Grade 5		MEDIUM STRENGTH	Medium Duty • Automotive & Machinery • Construction • General industrial use
SAE Grade 8		HIGH STRENGTH	High Strength • Heavy equipment • Structural & Industrial • High load applications
METRIC CLASSES			
Metric Class 8.8	8.8	MEDIUM STRENGTH	General Purpose • General construction • Machinery & Automotive • Everyday applications
Metric Class 10.9	10.9	HIGH STRENGTH	Heavy Duty • Heavy machinery • Automotive & Industrial equip. • High strength applications
Metric Class 12.9	12.9	VERY HIGH STRENGTH	Maximum Strength • High performance • Critical fastening & extreme load • Precision applications

NEED A STRUCTURAL OR SPECIALTY FASTENER?



Beyond standard SAE and Metric grades, we also stock a wide range of structural and specialty fasteners.

STRUCTURAL GRADES
A325 • A490 • A193
B7 • F1554
GR. 36 + 55

RELATED HARDWARE
Heavy Hex Nuts • Hardened Washers • Threaded Rod
Special Alloys • And More

MATERIALS & FINISHES

Corrosion Resistance
Low to High 1/5



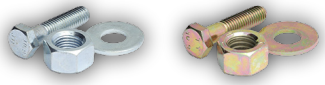
Plain Finish is uncoated carbon steel, best for **indoor applications** or where the fastener will be painted or coated.



Alloy Steel is used in **high-strength industrial and structural applications** and is typically black oxide finished.

Corrosion Resistance
Low to High 2/5

Zinc-Plated Steel *(Clear or **Yellow Zinc**)* is ideal for general indoor use, providing economical corrosion protection in dry environments.



Corrosion Resistance
Low to High 3/5



Hot-Dipped Galvanized Steel is recommended for **outdoor construction** where increased corrosion resistance is required.

Corrosion Resistance
Low to High 5/5



Stainless Steel (18-8 and 316) is ideal for **marine, coastal and harsh environments** requiring maximum corrosion resistance.

ALSO AVAILABLE

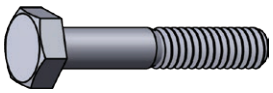


Additional materials and finishes available upon request, including:

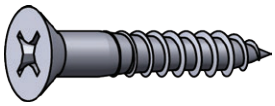
Aluminum | Brass | Bronze | Chrome Plated | Nickel Plated | And More

PRIME INDUSTRIAL FASTENERS

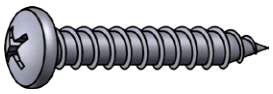
Common Fastener Types



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.



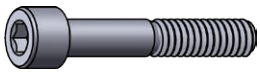
Wood screws have large threads and a smooth shank f or pulling two pieces of material together. They can be used in wood and other soft materials.



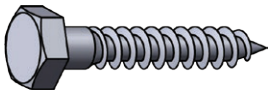
Sheet metal screws have sharp points and threads, and are designed to be driven directly into sheet metal. They can also be used in softer materials like plastic, fiberglass, or wood.



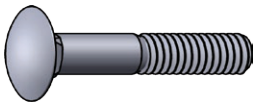
Machine screws are fully threaded for use with a nut or in a tapped hole. Certain types are sometimes referred to as stove bolts.



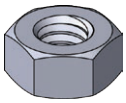
Socket screws are machine screws with an internal hex socket (Allen) drive. Longer lengths may have a smooth shank.



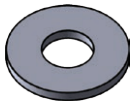
Lag bolts, or lag screws, are large wood screws with hex heads. Typically used for wood construction.



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.



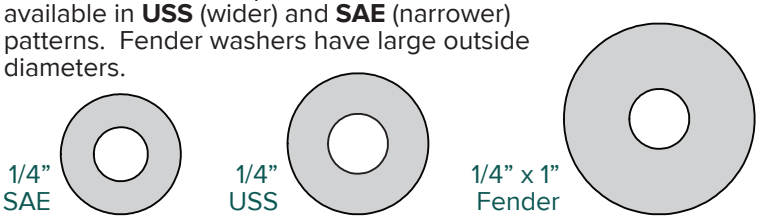
Washers spread the load over a greater surface area when tightening a bolt, screw or nut. Lock washers help prevent loosening.

Nut & Washer Sizes

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



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.



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.

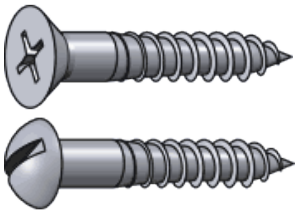




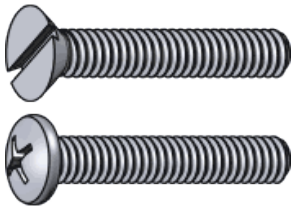
Alloy steel is highly hardened and usually black oxide and/or oil coated, offering little corrosion resistance.

Fastener Categories

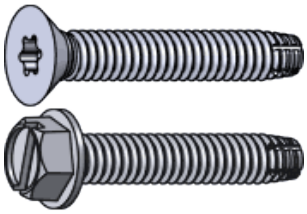
PRIME INDUSTRIAL FASTENERS



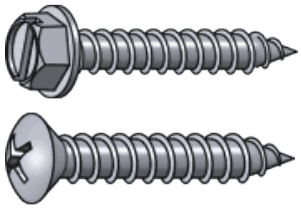
Wood Screws
Screws with a smooth shank and tapered point for use in wood. Abbreviated WS.



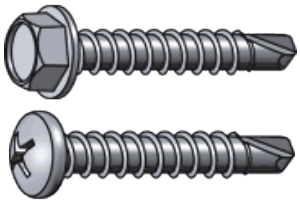
Machine Screws
Screws with threads for use with a nut or tapped hole. Abbreviated MS.



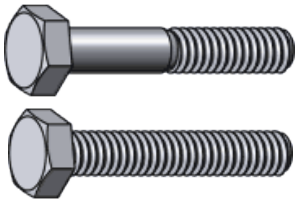
Thread Cutting Machine Screws
Machine screws with a thread cutting (self tapping) point.



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



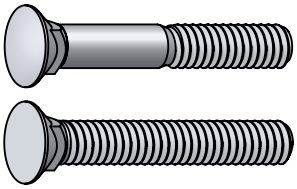
Self Drilling SMS
A sheet metal screw with a self drilling point.



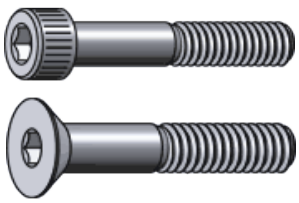
Hex Bolts
Bolts with a hexagonal head with threads for use with a nut or tapped hole.



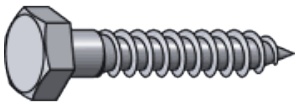
Carriage Bolts
Bolts with a smooth rounded head that has a small square section underneath.



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.



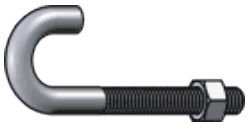
Lag Bolts
Bolts with a wood thread and pointed tip. Abbreviated Lag.



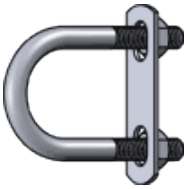
Eye Bolts
A bolt with a circular ring on the head end. Used for attaching a rope or chain.



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.



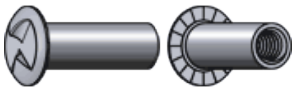
Shoulder Bolts
Shoulder bolts (also known as stripper bolts) are used to create a pivot point.



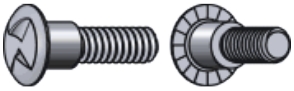
Elevator Bolts
Elevator bolts are often used in conveyor systems. They have a large, flat head.

Fastener Categories (continued)

PRIME INDUSTRIAL FASTENERS



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.

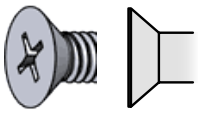


Cotter Pins
Cotter or split pins have two tines which are bent apart to hold them in place.

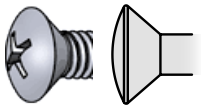


Rivets
Used to join sheets of metal. During installation the rivet body is deformed to permanently lock in place. Blind rivets can be installed without access to the back side of the material.

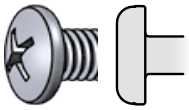
Head Styles



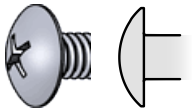
Flat
A countersunk head with a flat top.
Abbreviated FH



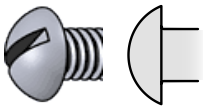
Oval
A countersunk head with a rounded top.
Abbreviated OH or OV



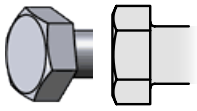
Pan
A slightly rounded head with short vertical sides.
Abbreviated PN



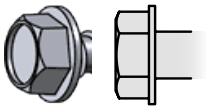
Truss
An extra wide head with a rounded top.



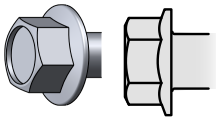
Round
A domed head.
Abbreviated RH



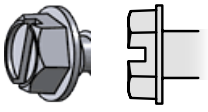
Hex
A hexagonal head
Abbreviated HH or HX



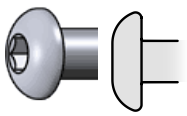
Hex Washer
A hex head with built in washer.



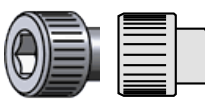
Hex Flange
A hex head with built in flange.



Slotted Hex Washer
A hex head with built in washer and a slot.

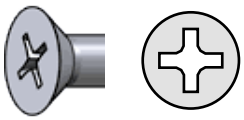


Button
A low-profile rounded head using a socket drive.

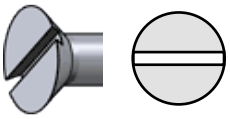


Socket Cap
A small cylindrical head using a socket drive.

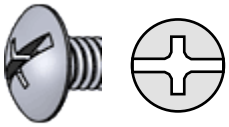
Drive Types



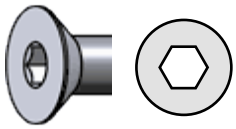
Phillips
An X-shaped drive.
Abbreviated PH.



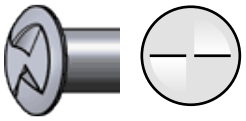
Slotted
A slot in the head.
Abbreviated SL.



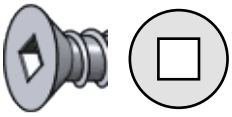
Combination
A combination of slotted and Phillips drives.
Abbreviated combo.



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.

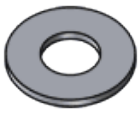


Square
Also known as Robertson drive.
Abbreviated SQ or SD.

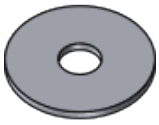


Star
A six-pointed star pattern, specifically designed to prevent cam-out and stripped heads.

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.



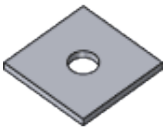
Split Lock
The most common style of washer used to prevent nuts and bolts from backing out.



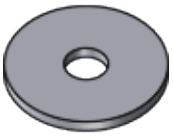
External Tooth Lock
A washer with external 'teeth'. Used to prevent nuts and bolts from backing out.



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



Square
A square shaped washer.



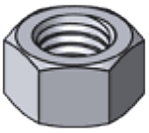
Dock
Dock washers have a larger outside diameter and are thicker than standard.



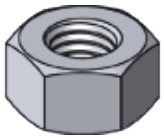
Ogee
Thick, large diameter, cast iron washers with a curved or sculpted appearance. Typically used in dock and wood construction.

Nut Types

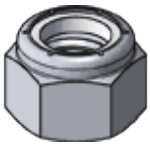
PRIME INDUSTRIAL FASTENERS



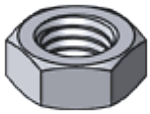
Hex
A six sided nut. Also referred to as a Finished Hex Nut.



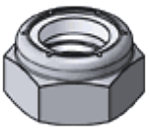
Heavy Hex
A heavier pattern version of a standard hex nut.



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



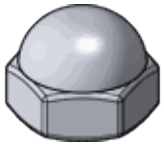
Jam
A hex nut with a reduced height.



Nylon Insert Jam Lock
A nylock nut with a reduced height.



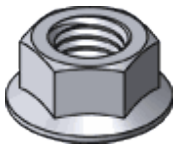
Wing
A nut with 'wings' for hand tightening.



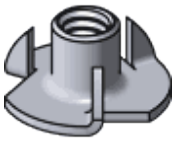
Cap
A nut with a domed top over the end of the fastener.



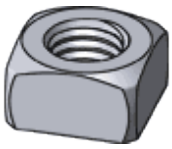
Acorn
Acorn nuts are a high crown type of cap nut, used for appearance.



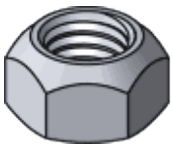
Flange
A nut with a built in washer like flange.



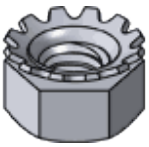
Tee
A nut designed to be driven into wood to create a threaded hole.



Square
A four sided nut.



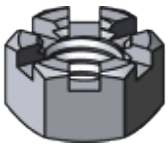
Prevailing Torque Lock
A non-reversible lock nut used for high temperature applications.



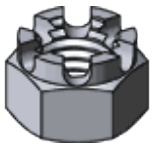
K-Lock or Kep
A nut with an attached free-spinning external tooth lock washer.



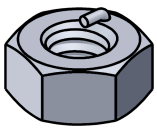
Coupling
Coupling nuts are long nuts used to connect pieces of threaded rod or other male fasteners.



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



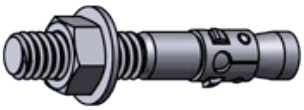
Castle
Castle nuts are used in conjunction with a cotter pin on drilled shank fasteners to prevent loosening.



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

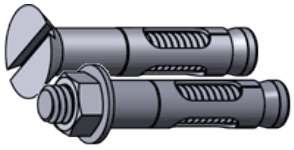
Anchoring Products

PRIME INDUSTRIAL FASTENERS



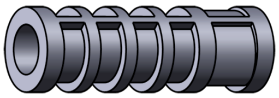
Stud Anchors

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



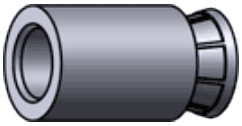
Sleeve Anchors

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



Lag Shields

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



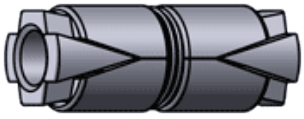
Machine Screw Anchors

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



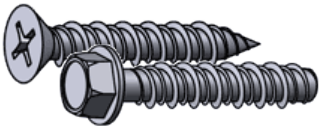
Drop-in Anchors

A heavy duty machine thread anchor for concrete or stone.



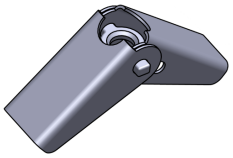
Double Expansion Sleeves

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



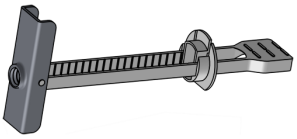
Spring Toggle Wings

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



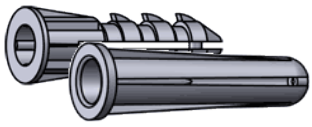
Plastic Toggle

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.



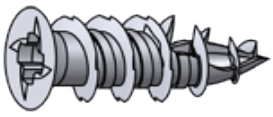
Kaptoggle®

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



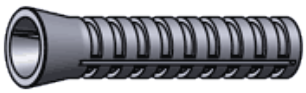
Conical Anchors

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



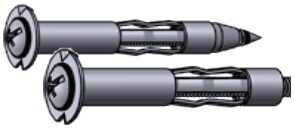
Self Drilling Drywall Anchors

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



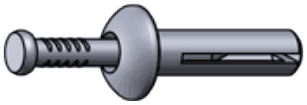
Wood Screw Anchors

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.