Earnest

Fastener Concepts

Lock Nuts Un-Locked

A Guide to Different Lock Nut Styles & Types

What Is a Lock Nut?

The term ***lock nut*** is used to describe a nut that is designed to provide a higher resistance to loosening when compared to a standard hex nut. Lock nuts are commonly used in applications that encounter vibration or impact forces that can cause a standard nut to loosen over time.

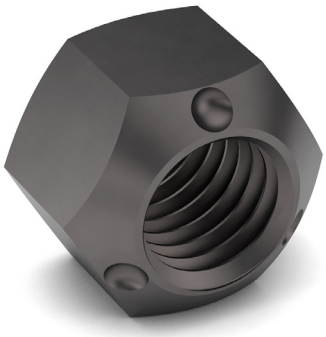
Through the years, different manufacturers have developed various lock nut designs that can make installation easier while increasing the nuts ability to stay tight once assembled. Many of these designs come with a proprietary name or a name that has become synonymous with lock nuts, such as Anco®, Drake®, Columbian®, Dura-Flex®, Philidas®, Security Locknut®, and Flex-Loc®.

To ensure consistency and reliability across the industry, organizations like the Industrial Fastener Institute (IFI) and the American National Standards Institute (ANSI) have established specifications that outline the minimum performance requirements for lock nuts. These specifications help provide a framework for evaluating different styles and designs, ensuring that they meet specific criteria for durability and effectiveness in preventing loosening.

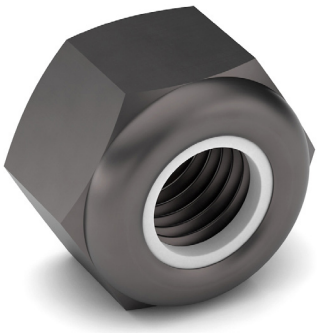
The most common styles of lock nuts sold today are classified as prevailing torque lock nuts. The term ***prevailing torque*** is used to describe a nut that requires a wrench to install the nut along the threads of a bolt (unlike free-spinning nuts which can be threaded on by hand).

Prevailing Torque Lock Nuts

Prevailing torque lock nuts typically fall into two main categories:



All Metal Lock Nuts



Nylon Insert Lock Nuts

All Metal Lock Nuts are also called distorted thread nuts or crimped nuts because the locking action is created by crimping the nut to cause a distortion in the threads. The distorted thread creates a prevailing torque due to what is known as an interference thread fit. Meaning, the threads within the nut are designed to grip or grab ahold of the mating bolt's threads when installed which creates the locking action.

The location and style of the crimp is determined by the manufacturer. Different manufacturers use different methods to create the crimp so the appearance will vary from one supplier to the next. All Metal Lock Nuts are commonly marketed under trade names like Stover®, Griptite®, Crownlock®, Uni-Torque®, etc. No matter how the crimp is formed, the prevailing torque that is created must meet the requirements specified in IFI 100/107 or ASME B18.16.6.

Prevailing Torque Lock Nuts (cont.)

Alternatively, Nylon Insert Lock Nuts create their locking action from a nylon ring that is inserted into the top of the nut. When a Nylon Insert Lock Nut is mated with a receiving screw, the nylon will then compress around the threads, creating a secure lock between both the nut and screw, illustrated in the image below. Note that nylon rings are only functional up to 250° F, making them ideal for standard applications but less suitable for high-heat environments.

U.S. manufacturers of Nylon Insert Lock Nuts will color code the nylon for identification. Nylon Insert Lock Nuts are another style of nut that is often called different names like Nyloc Nut, Elastic Stop Nut, Non-metallic Insert Nut, Polyamide Insert Nut, etc.

Both the All Metal and the Nylon Insert Lock Nut designs are available in a flange nut design as well. A flange nut provides a built-in washer that distributes the clamping load over a wider area when compared to a regular hex lock nut. The flange nut design eliminates the need for a flat washer and is especially beneficial when dealing with oversized or slotted holes, offering improved load distribution and a more secure assembly.

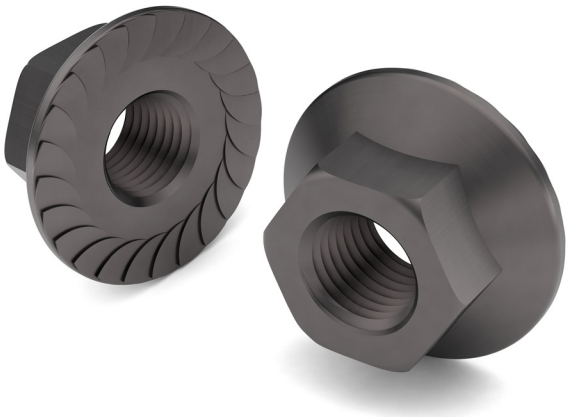
Hex Serrated Flange Lock Nuts

Another style of flange lock nut available is the Hex Serrated Flange Lock Nut, shown below. This design is a free-spinning nut with no prevailing torque feature that has locking serrations built into the bearing face of the flange. When installed, the serrations allow the nut to glide smoothly over the material being clamped in a clockwise direction. When the nut is loosened in the counterclockwise direction, the serrations engage, locking onto their installation surface.

Some manufacturers offer exclusive serration designs that they feel provide better locking capabilities for their specific style, using names like Whizlock®, Spinlock®, and Rip-Lock®.

The dimensional and physical property requirements for the most common styles of lock nuts are defined in the IFI standard 100/107. Prevailing torque nuts are also specified under the ANSI spec of ASME B18.16.6.

Additionally, the strength levels for inch sized lock nuts can sometimes cause confusion. Lock nuts are commonly rated according to the IFI strength levels of Grade A, B, and C, for hex style lock nuts as well as Grade F and G, for flange lock nuts. ASME B18.16.6 also uses the strength designations of NE2, NE5, and NE8 for Nylon Insert Lock Nuts.



Lock Nut Grades and Styles

For those who are more familiar with the SAE Grades of 2, 5, and 8, these lock nut grades may be unclear. The table below provides some guidance as to the lock nut grade that should be used with the corresponding bolt grade.

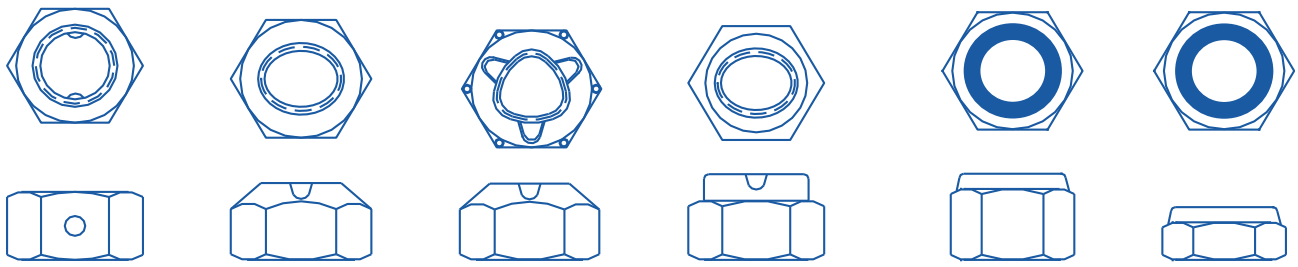
Lock Nut Grade	Bolt Strength Level
Grade A or NE2	Grade 2
Grade B, F or NE5	Grade 5
Grade C, G or NE8	Grade 8

Additionally, the illustration below provides guidance on the most common styles of lock nuts used today.

Hex Style Lock Nuts

All Metal Styles

Nylon Insert Styles



Side Crimp - Two Way All Metal Lock Nut

Top Lock Dual (Oval) Crimp All Metal Lock Nut

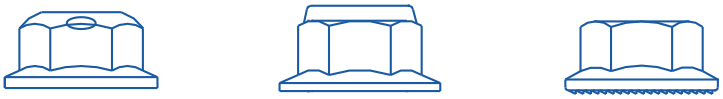
Top Lock Tri-Crimp All Metal Lock Nut

Top Lock Collar Style All Metal Lock Nut

Nylon Insert Lock Nut

Nylon Insert Thin Lock Nut

Flange Style Lock Nuts



All Metal Top Lock Flange Lock Nut

Nylon Insert Flange Lock Nut

Serrated Flange Lock Nut

The Essential Role of Lock Nuts

Overall, lock nuts play an essential role in maintaining the integrity of our fastened assemblies, especially in environments where vibration, movement, or heavy loads could compromise a standard fastener. So, whether you're working with machinery, construction equipment, or with automotive applications, selecting the right lock nut can make all the difference in maintaining the lifespan of your fastened assembly.

At Earnest Machine, we offer an extensive selection of lock nuts, available in a wide range of sizes, grades, styles, and finishes to meet the diverse needs of our customers. If you have questions about our selection of lock nuts or any of our available products, please don't hesitate to call—our team is happy to help!

Contact Us Today:

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