

## The difference between Grade 5 Hex Serrated Flange Screws and 120M Case Hardened Hex Serrated Flange Screws

Earnest Machine stocks both a Grade 5 and a 120M Case Hardened Hex Serrated Flange Locking Screw. Now, you might be scratching your head saying, “**Isn’t Grade 5 the same as 120M?**” And you would be correct. It is. However, Earnest Machine specifies a selection of Grade 5 sizes to be case hardened, also called surface hardened, making them uniquely stronger than a standard Grade 5 fastener. It is important to know a bit about case hardening before we talk about the differences of the two lines.

### What is Case Hardening?

Case Hardening is a heat treating process that makes the outer surface of steel stronger while leaving the inner core of the parts softer. Think of it as a very strong outer shell on the steel that resists friction and wear. It still provides 120,000 psi of tensile strength and all of the performance characteristics of a Grade 5 fastener, but the outer shell makes it stronger and more resistant to friction wear.



### Why case harden Hex Serrated Flange Screws?

With a Hex Serrated Locking Screw, the teeth under the flange of the screw provide the locking action in steel to steel fastening. The increased surface strength that the case hardening process provides results in tougher, stronger teeth that “bite” into the material they are tightened against. Without the added bite that the case hardening process provides the tips of the teeth can roll over and become dull when tightened thus compromising the locking ability. With standard Grade 5 locking screws the lock may not be as tight as you think. When locking screws are used to clamp steel on steel you want the added strength that the case hardening provides so that the teeth can bite into and truly grip the bearing surface to resist rotation.

## Are Grade 5 and 120M Case Hardened Hex Serrated Flange Screws interchangeable?

The short answer is yes, and no. The physical properties are designed to be equivalent to the strength requirements for a Grade 5 cap screw (120,000 psi tensile strength) with the addition of a case hardened surface treatment. The case hardened surface adds strength and toughness to the locking serrations providing resistance to rounding off and ensures that they bite into the surface they are being installed on. The "120M" head marking (on sizes 1/4" and larger) designates that the product has a tensile strength of 120,000 psi (equivalent to Grade 5).

The case hardened line is designed to be used in any application calling for a Grade 5 strength level. However, you cannot just supply a case hardened style when a Grade 5 part is ordered. Grade 5 specs do not permit the surface to be higher in hardness than the core, so a case hardened style does not technically meet Grade 5. So if you have a question about using the case hardened in place of standard Grade 5, seek the council of the specifying engineer.

### Earnest's 120M Case Hardened Serrated Flange Locking Screws:

- Provides the strength and toughness of a Grade 5 screw
- Permits multiple re-uses
- Added strength to locking teeth
- Increased wear resistance

## Characteristics of Case Hardening



Case Hardening is a heat treating process that makes the outer surface of steel stronger while leaving the inner core of the parts softer.

The case hardened surface adds strength and toughness to the serrations on a Hex Serrated Flange Screw providing resistance to rounding off and ensures that they bite into the surface they are being installed on.

An Earnest Sales Representative can help you determine which Hex Serrated Flange product is right for your application. Inquire today.



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