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News & Tips

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So, What Really is the Best Thread Repair?

May sound funny, but there isn't one! Let's tell you why. It's because every job is different. So, first let's look at the best of the common types of thread insert. Here they are:

Time-Sert

Very thin wall. Ideal for a first repair or where there's no room around the stripped thread.

Big-Sert

Thick wall version of Time-Sert for second repair or badly damaged hole.

NuCoil

Helically coiled wire thread insert for first repair. The original type of thread repair.

Loc-in-Sert

Thick wall insert for second repair or where hole is badly damaged.

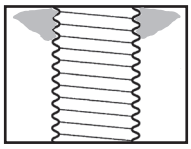
Time-Serts and helical coil type inserts like NuCoil share the feature of being the thinnest sectioned inserts. When there's not much "meat" around the stripped hole, you really can only use one of these.

Then, What Are The Advantages of Each Type

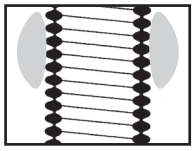
Helical Coil Type Wire Inserts

Probably the best known type of thread insert. The history is that around World War II an insert called "Aero Thread" was made as a wound wire thread insert formed from teardrop shaped wire. This then evolved into the diamond shape wire insert we now know. By about 1960 a universal standard for these inserts was accepted and wire thread inserts became generally interchangeable among the various manufacturers.

So much for history, wire thread inserts are still the strongest type of threaded connection. For this reason threads in critical applications such as inside aircraft turbines and nuclear reactors are fitted with wire thread insert from new. That's right, critical threads where a breakage could endanger life are not just tapped straight into the parent metal. The reason is explained in the diagrams below. The grey patches in these pictures represent stress in the parent metal.



Above picture represents a bolt straight into it's parent material without an insert. Notice that the grey stressed area is mainly around the top 3 threads. In fact if you could measure the stress you would find that around 50% of load was actually on the first thread!!



This picture (above) represents a bolted connection with a wire thread insert. The grey "stressed" area in this case is nicely distributed. Stress is fairly even over about 6 threads. This means that the connection is much less likely to fail and it also means the parent material will have a much longer fatigue life.

So, the advantage of a helically coiled wire thread insert is that it makes the strongest and most durable threaded assembly that is currently known to engineers. The reason for this is that the wire can actually flex slightly and acts like a shock absorber between the solid, unyielding parent metal and the equally solid bolt.

There are a couple of uses where wire thread inserts are not so good. One is in sump and drain hole plugs where the thread is done up and undone frequently and the other is in adjusting screw holes. The flexing of the wire coil that is the insert's main advantage actually works against it in the 2 applications mentioned. Let's explain. When a coil type insert flexes many times in a hole, it gradually spreads the thread track in the parent material. Then, because the insert depends on friction to hold it in, once the "V" is spread by this flexing, the main surface of the insert is no longer in proper contact with the parent material. This means there is far less surface area in contact and friction will no longer hold the insert in. Consequently the insert then begins to wind out as the thread is undone.

Another disadvantage of helical coil type inserts is that they are sometimes harder to fit than a solid bush. This applies especially In deep or inaccessible holes.

Time-Serts

These are thin walled, the same thickness as a wire thread insert and can also fix a hole where there's very little spare material around the repair. They are not quite as good at stress distribution as a helical coil type insert but provide a steel thread in alloy and because they are a solid one piece insert they are easier to fit than coils. The last few internal threads of Time-Serts are not completely formed i.e. there is excess metal left in them. This is on purpose. When you fit a Time-Sert, you run a fluteless, roll forming tap through the insert and this forms the unformed metal and squeezes it out to lock the insert in. Time-Serts are also better for sparkplug hole repairs.

Big-Serts

Big-Serts are a thick wall Time-Sert used as a second repair where a Helicoil or Time-Sert has stripped out or when a hole is too badly damaged or too far oversize to take a thin wall insert. Big-Serts require special tooling and as with Time-Sert, excess metal is left in the last few threads of the insert. A fluteless tap is used to fit the BigSert. As this tap is forming the last few threads it also squeezes a small roll pin out into the parent thread to lock the Big-Sert in.

Loc-in-Serts

Loc-in-Serts use standard size taps for fitting, so special tooling is not needed and setup cost is low. They are thick walled threaded bushes used for a repair where a Helicoil or Time-Sert has stripped out or the hole is too far oversize to take a thin walled insert. They are also used in such things as plastic moulding and metal stamping dies and machinery. In these uses threads are done up and undone regularly and they consequently wear. The Loc-in-Sert can be taken out fairly easily and a new threaded bush replaces the worn one without the need to retap the hole. Loc-in-Serts come with a band of pre-applied Loctite on the outside. As the insert is wound in the Loctite activates and fixes the insert in.

Need a Catalogue or Thread Chart
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