

Ask Larry...

Common Misconceptions With Self-Sealing Fasteners

Recently I received a call from Scott, an engineer from a small instrumentation company in Pennsylvania, USA. Scott said, "I have a project that requires a self-sealing fastener. Although I am an engineer I come from a family of electricians. Electricians use a lot of binder head screws. Binder head screws have a groove under the head that is used to direct and secure electrical wire as the screw is tightened. Since the screw already has a groove, why can't I just put an O-ring on it and use it as a self-sealing fastener?"

I said, "Scott, that's a good question, and many people have asked similar questions. Let me say that an O-ring and a groove don't make a self-sealing fastener unless the groove is precisely calculated to apply proper compression and containment of the O-ring. Similarly, let's say you have a screw with a Phillips® recess, but all you have available is a slotted screwdriver. You might be able to use the slotted screwdriver to fasten the Phillips recess screw, but that's not the purpose for which it was designed and in most cases the end result will be messy. In the same way, if you use a binder head screw with an O-ring or any nonprecision grooved fastener (as is common with low-end, expired-patent, self-sealing fasteners) your chance of sealing success is very low. Just like the slotted screwdriver will tear up the Phillips recess, the groove in the binder head or expired-patent designs will tear up the O-ring. The O-ring might appear to seal initially because the O-ring has been smashed into the groove and mating product, but over time the compression set of the O-ring will cause sealing failure.

"As with anything, if you need guaranteed results, you must use the proper tool for the job. Scott, the real question you have to ask yourself, is what impact will it have on your product and company reputation if you used a self-sealing fastener that didn't seal? If the answer is none, then it doesn't matter much what you use, but if it is not, then you require a self-sealing fastener that can guarantee results."

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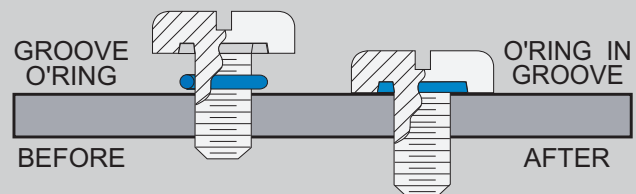
Scott answered, "If the fastener didn't seal, then my project would fail."

I said, "Then it is clear that you need a self-sealing fastener that can guarantee sealing success."

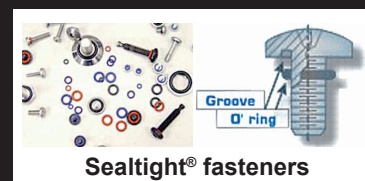
He agreed.

Like Scott, choosing the best self-sealing fastener can be the most important part of your product design, but it can also be very confusing since some companies with expired-patent products are selling millions of self-sealing fasteners by making exaggerated claims of sealing success. The question then becomes how can someone who doesn't know self-sealing fasteners well, be sure they are buying the right self-sealing fasteners for their product? The importance lies in being able to recognize the difference so that you are not stuck with a knock-off. I look forward to clarifying this issue in future columns to make it easier for engineers and buyers to make the right decision for their companies. **Ff**

Example of what happens when you use a screw with a nonprecision groove such as with the binder head or expired-patent products.



O-ring in precision groove assembly.



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