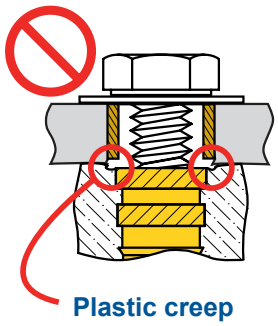
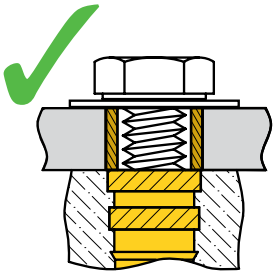
SPIROL® MATING COMPRESSION LIMITERS AND THREADED INSERTS

The weakest sections of most plastic assemblies are the joints and assembly points. During the assembly of mating components, the screw has to be tightened with sufficient torque to produce the recommended axial tension load between the host component and the threads of the screw in order to prevent loosening. A common problem with bolted joints is that plastics are susceptible to **creep** or stress relaxation as displayed in the drawing on the right. Under loads well below the elastic limit, plastics will lose their ability to maintain a load. When this occurs, the threaded connection becomes loose.



Plastic creep

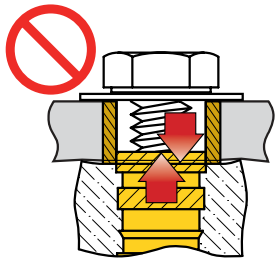


Proper configuration

In applications where the mating component is also plastic, **Threaded Inserts** may be used in conjunction with Compression Limiters to enable the appropriate installation torque to be applied to the screw without stripping the threads in the plastic assembly.

Metal threaded Inserts significantly improve joint strength in plastic parts and are not themselves susceptible to creep. The larger body diameter and body design of the Insert allow the appropriate installation torque to be applied to the screw. These joints do not become loose over time since the brass provides permanent creep resistance for the entire load path of the thread. Additionally, the Inserts enable unlimited assembly/disassembly of the components without compromising the integrity of the threads.

It is essential for the Compression Limiter to be in contact with the Insert. The Insert – and not the plastic – must carry the load. Otherwise the Insert will tend to want to pull out of the plastic as the bolt is torqued. This condition is called **jack-out** and under no circumstance is this acceptable.



Jack-out

The surface area of **SPIROL**'s Series 14, 19, 24, 41 and 45 Inserts is more than adequate for most applications.

SPIROL® Series 14, 19, 24, 41 and 45 Inserts
for Plastic Assemblies

For increased surface contact between the Insert and the Compression Limiter, Design Engineers may choose to incorporate one of the headed Insert Series 16, 20, 25, 28, 30 or 51.

SPIROL® Series 16, 20, 25, 28, 30 and 51 Inserts
for Plastic Assemblies

In applications using multiple Inserts where misalignment needs to be accommodated, the standard solution is to increase the clearance between the internal diameter of the Compression Limiter and the external diameter of the assembly screw. This obviously has the potential of the Compression Limiter not aligning satisfactorily with the Insert. In these situations a Headed Insert is always recommended. Consideration can also be given to increasing the wall thickness of the Compression Limiter.

If the pilot diameter of the Insert being used is too small for the inside diameter of the Compression Limiter, then a special Compression Limiter with reduced clearance between the assembly screw may resolve the problem. This of course also reduces permissible misalignment.

If the surface area of the Insert is inadequate for proper contact with the Compression Limiter, then the only solution is using a plastic in the mating component which has good anti-creep characteristics and using a Compression Limiter with maximum wall thickness for better distribution of the load. Jack-out in these situations will be a concern and needs to be addressed by avoiding over-torquing of the assembly screw.

SPIROL®

Innovative fastening solutions.
Lower assembly costs.

Challenge Us!

SPIROL Application Engineers will review your application needs and work with your design team to recommend the best solution. One way to start the process is to visit our **Optimal Application Engineering** portal at www.**SPIROL**.com.

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