

**SPIROL's** roll formed hardened Bushings are designed to meet one or more of the following objectives:

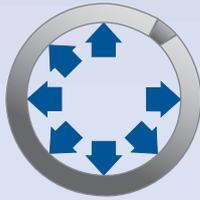
- ⊙ **Align mating components,**
- ⊙ **Eliminate drilling of a separate bolt hole,**
- ⊙ **Protect bolts from shear loading, and/or**
- ⊙ **Maintain joint integrity**

Although these hollow, lightweight Bushings are not precision ground and do not require precision holes, thus saving in component and hole preparation costs, they are capable of precision alignment if the design guidelines are followed. Further savings can be achieved by using the inside of the Bushing for the bolt and thus eliminating the cost of a separate bolt hole. This design concept also protects the bolt from shear loads perpendicular to the bolt and isolates the forces on the bolt to tension loading. Shear forces acting on a bolted joint cause the joint members to slip back and forth, which causes the bolts and nuts to rotate, reducing the pre-load tension. This is particularly the case with short bolts with a reduced clamping distance.



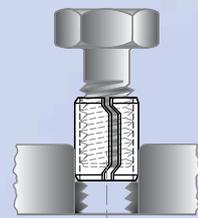
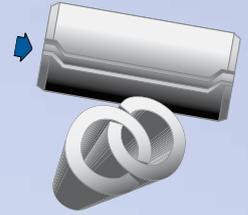
### SPRING ACTION

The diameter of the Bushing is slightly larger than the hole. The spring action of the Bushing allows it to be installed into a drilled or cored hole and assume the diameter of the hole. It is self-retained once installed.



### STAGGERED SEAM

The staggered seam prevents interlocking, making these Bushings suitable for automatic feeding and eliminating the need to separate them during manual assembly.



### CONTROLLED INSIDE DIAMETER

The inside diameter of the Dowel Bushings is designed to provide clearance for a bolt through the Bushing for the purpose of fastening the aligned components together. This isolates the bolt from the shear loading and increases the joint integrity. It also eliminates the cost of a separate hole.

### LEAD-IN CHAMFERS

The beveled chamfer around the entire periphery of the Bushing is designed to facilitate ease of insertion and to avoid skiving of the Bushing during installation.



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Coiled Spring Pins



Slotted Spring Pins



Solid Pins



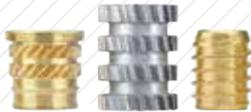
Alignment Dowels /  
Bushings



Spacers & Rolled  
Tubular Components



Compression  
Limiters



Threaded Inserts  
for Plastics



Railroad Nuts



Disc Springs



Precision Shims &  
Thin Metal Stampings



Precision Washers



Parts Feeding  
Technology



Pin Installation  
Technology



Insert Installation  
Technology



Compression Limiter  
Installation Technology

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SPIROL offers complimentary Application Engineering support! We will assist on new designs as well as help resolve issues, and recommend cost savings on existing designs. Let us help by visiting **Application Engineering Services** on [SPIROL.co.uk](http://SPIROL.co.uk).