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WHITE PAPER

# How to Reduce Assembly Costs with Coiled Spring Pins

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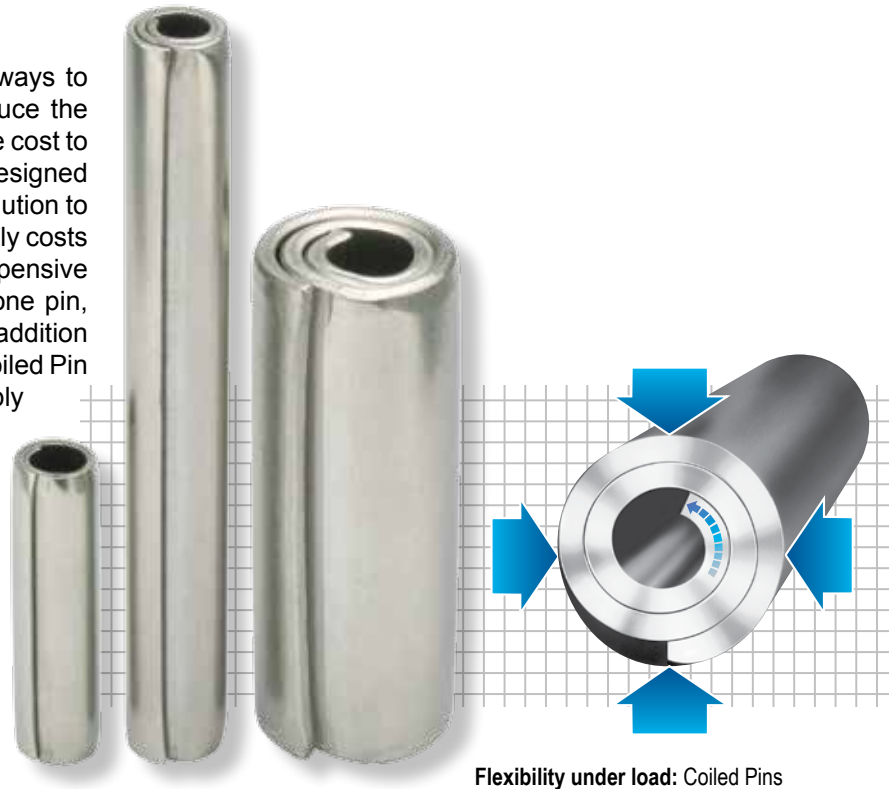
In any assembled component there are two ways to reduce the overall cost of the assembly: reduce the cost of the individual components or reduce the cost to assemble the components. The Coiled Pin is designed to be a versatile, integral, and cost effective solution to many assembly problems. It can lower assembly costs by reducing the complexity of larger, more expensive components, or by combining functions into one pin, eliminating the need for additional pieces. In addition to simplifying the design of an assembly, the Coiled Pin is easy to automate, thereby reducing assembly time and the labor required for completion.

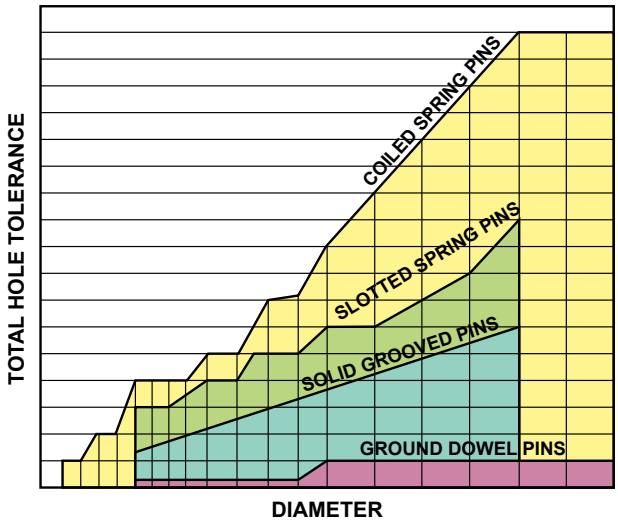


**Flexibility under load:** Coiled Pins continue to flex after insertion when a load is applied to the pin.

Coiled Pins have several unique characteristics that allow them to reduce total assembly cost. The Coiled Pin is designed to be an interference fit part that conforms to the shape and size of the mating component's hole. By coiling, or flexing, during insertion into the hole, the pin provides a retention force that will keep the pin in the hole for the life of the assembly. Unlike other types of spring pins that bend only opposite the seam during installation, the entire Coiled Pin deflects, thus providing comparatively low insertion forces and nearly uniform contact stresses on the inside surface of the hole. This is important in protecting the mating component, since poor insertion and high contact stresses can lead to permanent damage to the mating component. It is not unusual to have a poorly designed pin skive either base material or plating from the host part during assembly, thereby causing poor joint performance or possibly reduced corrosion protection.

In comparison to solid pins, when Coiled Pins are used there is no permanent damage to the host part during assembly. Pins having external knurls or grooves will always, by design, cut into the mating part. Even hardened ground dowel pins, when driven into a precisely reamed hole, will damage the hole when removed. It is no accident that a standard series of oversize dowel pins is available. This method of assembly results in the inability to rework a part either in the factory or in the field. With a Coiled Pin, it is simply a matter of driving the pin out, the host part is like new.

During it's use, the Coiled Pin brings a level of flexibility and shock absorption that is impossible to match with any other type of pin. A gear pinned to a shaft may have a near constant shear load applied when running under a constant load, but upon startup and braking, significant increases in shear loads are realized. When using a solid pin, this peak shear load must be accounted for, often requiring larger shafts or stronger materials which all increase costs. When using a Coiled Pin, the pin will deflect slightly, absorbing some of the excess startup energy. Once steady state operation is achieved, the Coiled Pin will return to it's original condition without damaging either itself or the mating parts. Compared to other spring pins, Coiled Pins can absorb considerably more deflection. In many applications, Coiled Pins can be used to replace a non-pin alternative. Axles, gasket retainers, pivots, hinges, and levers are all common uses of Coiled Pins where the inherent benefits of the Coiled Pin enable it to replace a traditionally non-pin component.




Coiled Spring Pins absorb the widest hole tolerances.

Hole preparation is another important factor in reducing costs. Coiled Pins operate in holes with relatively wide tolerance. In most operations, Coiled Pins can be installed in holes that have been drilled rather than prepared with an expensive reaming operation. The flexibility of the Coiled Pin also means that holes do not need to be accurately aligned. It is no longer necessary to drill and pin at assembly, you only need to pin. In addition, stamped, fine blanked, cast, sintered, or laminate assemblies are all suitable hosts when using Coiled Pins.

None of these features are beneficial if the pin cannot be easily presented for installation. The Coiled Pin has square, burr free ends with concentric chamfers on both ends, and is manufactured to tight length tolerances. These features allow for easy engagement with the hole and problem free bowl & tube feeding. The Coiled Pin does not need to be oriented within the mating parts, thereby permitting semi or fully automated assembly systems to operate in lieu of labor intensive pinning operations.


To further enhance the ability of the Coiled Pin to reduce costs, the Coiled Pin is available in three duties so that the pins may be tailored to the host material or application requirements. A wide variety of standard materials and finishes provide for the necessary strength, corrosion resistance, fatigue life, and appearance to suit any need. Finally, special configurations are possible, further assuring the Coiled Pin can meet nearly any pinning application need. When trying to reduce costs, it is important to remember that individual component costs are not as important as total cost. Sometimes the more expensive component pays back big dividends.

***SPIROL offers complimentary Application Engineering assitance.***

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