

Measurement Techniques for the Inspection of Series 550 Coiled Pins for Cosmetic Cases

by Ian Martin, Quality Manager
SPIROL Industries Ltd.

SPIROL® Series 550 Cosmetic Coiled Pins were designed specifically to be used as hinge pins in cosmetic cases. The seam of this extra light duty Coiled Pin is 'tucked' or rolled to ensure the pin remains round. In addition, the seam is prepared with a bevelled edge to soften the transition into the 'comma' area (see Figure 1). A key characteristic of a Coiled Pin is that the diameter of the pin at the seam is equal to or less than the diameter adjacent to the seam. This prevents the edge of the material from contacting the inside diameter of the hole wall and prevents skiving when inserted. Once installed, the 1½ coil formation exerts the ideal amount of radial force to provide self-retention as well as the desired swing torque without damaging the plastic. Considering that the pin is a functional spring, it will absorb shock and vibration, isolating the plastic from excessive force that could open up the hole. The result is exceptional performance and preservation of the desired fit and function throughout the life of the product. These factors combine to make the **SPIROL® Series 550 Cosmetic Coiled Pin** ideal for hinges in cosmetic cases.

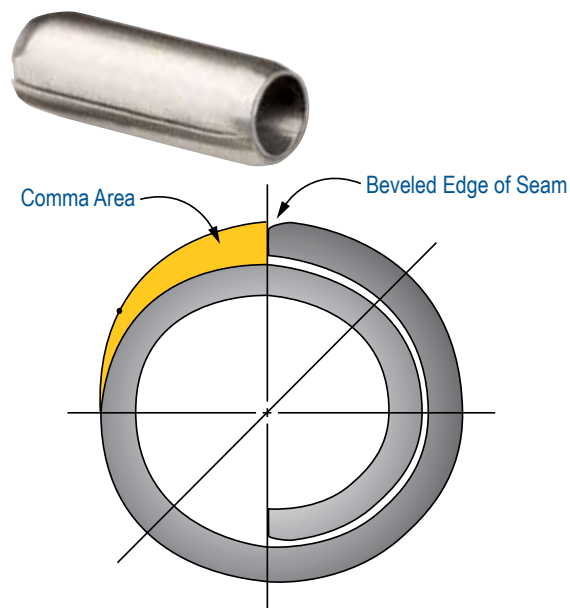


Figure 1. The Coiled Pin's seam is prepared with a bevelled edge to soften the transition into the 'comma' area. This design feature ensures that there are no "high spots" at the seam.

Diameter Measurement

Diameter is measured utilising a spline type micrometre (Fig. 2a) with reduced measuring faces. Standard micrometres (Fig. 2b) are too large and do not lend themselves to measuring such tiny parts. It is also highly recommended that a binocular magnifier/optivisor (Fig. 3) is used to ensure correct orientation of parts is achieved during inspection.



Figure 2a. Spline type micrometre with reduced measuring face



Figure 2b. Standard Micrometre

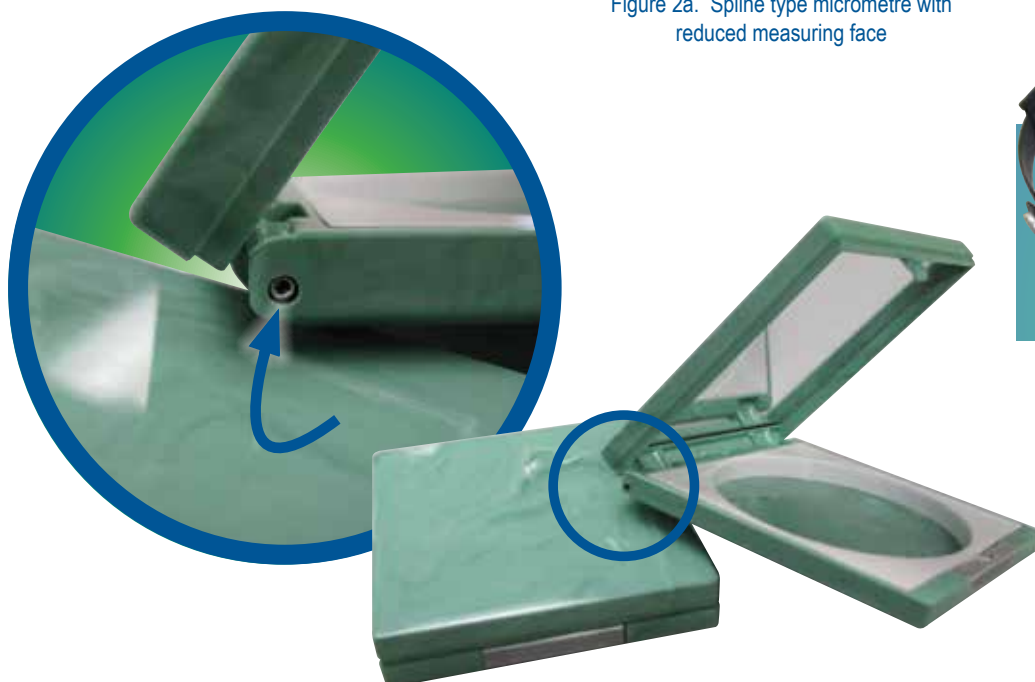


Figure 3. Binocular Magnifier/Optivisor

Diameter Measurement *(continued)*

The Coiled Pin will be within specification over 270° of the outer circumference. Micrometre measurements are taken at 0°, 45°, and 90° to the seam as depicted in the diagrams below (Fig. 4). It is critical that the pin be centred between the upper and lower anvils and that the micrometre not be tightened beyond the point at which it contacts the pin. **The tiniest amount of excess compression will yield an incorrect reading.** Diameter is to be measured a minimum of one pin diameter in length from the end of the pin. This eliminates measurement error relating to the transition from chamfer to tenon diameter. For example, when measuring a Ø1.2 mm Coiled Pin, diameter would be measured no closer than 1.2 mm to the end of the pin.

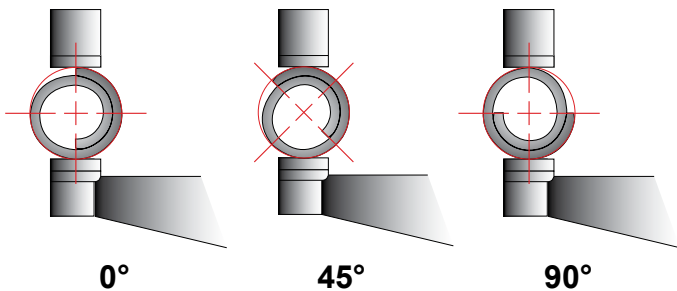


Figure 4. Micrometre measurements.

The use of a micrometre stand will (Fig. 5) make it easier for the inspector to correctly locate the pin between the micrometre anvils and ensure no excessive pressure is applied during measuring. Hold the pin between the thumb and forefinger in the correctly orientated position and gently wind down the micrometre spindle until the anvils make contact with the pin.

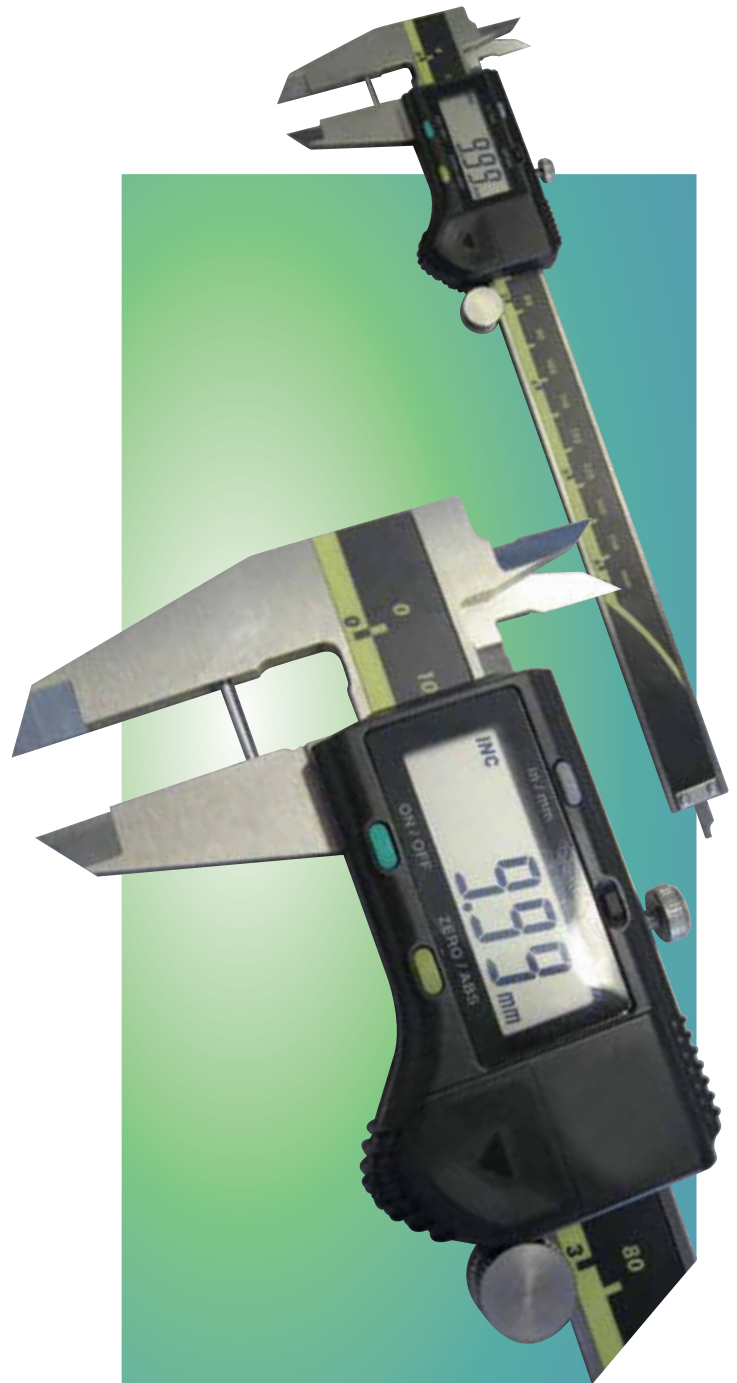
Extreme care has to be taken while performing the inspection due to the extreme flexibility of the pin. Unlike when measuring more rigid components, contact with the pin should be determined more through sight using the optivisor (or other type of magnifying lens) and the initial feel of the pin between thumb and forefinger rather than feel of the micrometre spindle tightening onto the pin. If the micrometre can be felt “tightening down” onto the pin after the initial contact, it has been over-tightened and the reading will be false.



Figure 5. Micrometre in Micrometre Stand

Length Measurement

The length of a Coiled Pin is easily measured utilising callipers. It is critical that the pin be positioned squarely between the anvils of the measuring tool. See the photographs below:



Chamfer Diameter ('B' Max)

The chamfer diameter or "B" (below) is designed to be smaller than the minimum recommended hole to facilitate insertion. This feature should be measured with an optical comparator. The easiest method by which to inspect the chamfer diameter is to either lay the pin horizontally in a v-block (Fig. 6a) or mount the pin vertically in modelling clay or plumbers putty (Fig. 6b) for support. Place the pin and mounting device on the comparator stage. If using the v-block, locate the y axis of the projection screen crosshair on the extreme edge of the chamfer. If using modelling clay, locate the x axis of the projection screen crosshair on the extreme edge of the chamfer. Zero the measuring mechanism before relocating the crosshair to the opposite edge of the chamfer. This will yield the chamfer diameter.

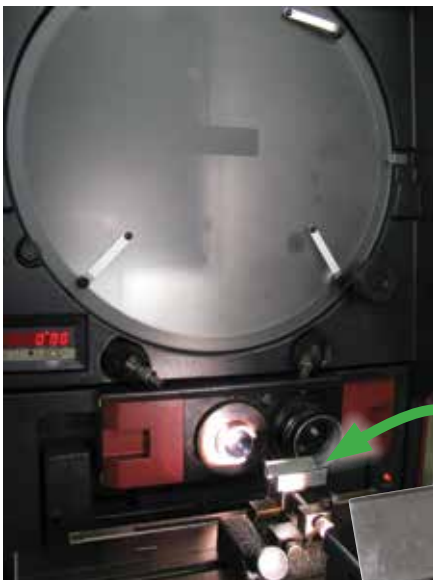
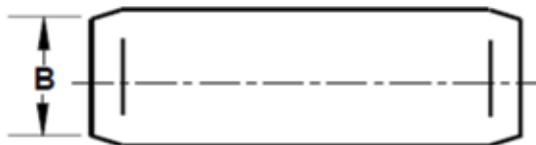


Figure 6a. Pin in v-block and optical comparator



Figure 6b. Pin in modelling clay and optical comparator

Design Guidelines for Cosmetic Cases

SPIROL Series 550 Cosmetic Pins



The use of a **Series 550 Cosmetic Coiled Pin** will simplify design as misalignment of the inner and outer holes to provide friction is no longer necessary. Intentional misalignment is difficult to control in production and induces stress in the hinge area causing cracking and pin fallout. Below are some guidelines that should be followed when designing cosmetic cases:

Ideally, all of the holes in the cover and base would be sized identically.

- If it is not possible to have identical hole sizes in the cover and the base, the tolerance may be divided between the outer and inner holes as follows:
 - Outer holes = Smaller half of tolerance
 - Inner holes = Larger half of tolerance
- Misalignment should not exceed 0.05 mm.
- 60% or more pin length retained by the inner boss.
- Minimum bearing surface in either boss should exceed three times the diameter of the pin.
- The inner boss hole depth should be at least 0.38 mm deeper than the retained pin length to prevent breaks at assembly.
- The minimum boss diameter should be two to three times the diameter of the pin to ensure adequate wall thickness.

SPIROL Model HC Horizontal, Dual Pin Inserter



Designed to install **SPIROL** Series 550 Coiled Pins into plastic hinges.

Technical Centres

Europe SPIROL United Kingdom
17 Princewood Road
Corby, Northants
NN17 4ET United Kingdom
Tel: +44 (0) 1536 444800
Fax: +44 (0) 1536 203415

SPIROL France
Cité de l'Automobile ZAC Croix Blandin
18 Rue Léna Bernstein
51100 Reims, France
Tel: +33 (0) 3 26 36 31 42
Fax: +33 (0) 3 26 09 19 76

SPIROL Germany
Ottostr. 4
80333 Munich, Germany
Tel: +49 (0) 89 4 111 905 71
Fax: +49 (0) 89 4 111 905 72

SPIROL Spain
Plantes 3 i 4
Gran Via de Carles III, 84
08028, Barcelona, Spain
Tel/Fax: +34 932 71 64 28

SPIROL Czech Republic
Pražská 1847
274 01 Slaný
Czech Republic
Tel/Fax: +420 313 562 283

SPIROL Poland
ul. Solec 38 lok. 10
00-394, Warszawa, Poland
Tel. +48 510 039 345

Americas SPIROL International Corporation
30 Rock Avenue
Danielson, Connecticut 06239 U.S.A.
Tel. +1 860 774 8571
Fax. +1 860 774 2048

SPIROL Shim Division
321 Remington Road
Stow, Ohio 44224 U.S.A.
Tel. +1 330 920 3655
Fax. +1 330 920 3659

SPIROL Canada
3103 St. Etienne Boulevard
Windsor, Ontario N8W 5B1 Canada
Tel. +1 519 974 3334
Fax. +1 519 974 6550

SPIROL Mexico
Avenida Avante #250
Parque Industrial Avante Apodaca
Apodaca, N.L. 66607 Mexico
Tel. +52 81 8385 4390
Fax. +52 81 8385 4391

SPIROL Brazil
Rua Mafalda Barnabé Soliane, 134
Comercial Vitória Martini, Distrito
Industrial
CEP 13347-610, Indaiatuba, SP, Brazil
Tel. +55 19 3936 2701
Fax. +55 19 3936 7121

Asia Pacific SPIROL Asia Headquarters
1st Floor, Building 22, Plot D9, District D
No. 122 HeDan Road
Wai Gao Qiao Free Trade Zone
Shanghai, China 200131
Tel: +86 (0) 21 5046-1451
Fax: +86 (0) 21 5046-1540

SPIROL Korea
16th Floor, 396 Seocho-daero,
Seocho-gu, Seoul, 06619, South Korea
Tel: +82 (0) 10 9429 1451

e-mail: info-uk@spirol.com

SPIROL.co.uk



Coiled Spring Pins



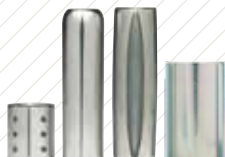
Slotted Spring Pins



Solid Pins



**Alignment Dowels /
Bushings**



**Spacers & Rolled
Tubular Components**



**Compression
Limiters**



**Threaded Inserts
for Plastics**



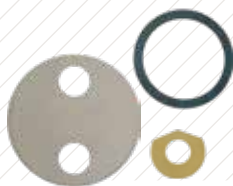
Railroad Nuts



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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