Radial Bearing (Class 0) Tolerances and Allowances

### (1) Inner Wheel

<table>
<thead>
<tr>
<th>Nominal Inner Diameter of Bearing</th>
<th>Outer Wheel</th>
<th>Inner Wheel</th>
</tr>
</thead>
<tbody>
<tr>
<td>abc</td>
<td>abc</td>
<td>abc</td>
</tr>
</tbody>
</table>

- **Nominal Outer Diameter of Bearing**
- **Outer Wheel Tolerance**
  - 0.6mm is included in this class.
  - 0.6mm is included in this class.
  - 0.6mm is included in this class.
- **Inner Wheel Tolerance**
  - 2.5mm is included in this class.
  - 2.5mm is included in this class.
  - 2.5mm is included in this class.

**Clearance between the spring inner diameter and shaft**

When clearance between the spring and the shaft is insufficient, the coil spring's external surface may come in contact with the shaft and be subject to abrasion at that point. This can lead to the spring eventually breaking at the point of wear. Excessive clearance with shafts, on the other hand, can lead to buckling of the coil spring. It is recommended that the shaft diameter be set approximately 1.0mm smaller than the inner diameter of the coil spring.

**Clearance between the spring OD and Counterbore Hole**

The coil spring expands in the outward direction when it deflects. Insufficient clearance between the spring OD and counterbore hole may cause the spring to break. Set up a step on the shaft as shown in Fig.-1 to prevent the coil spring's internal surface from touching the shaft when it bends.

**How to Use Coil Springs and Precautions**

1. **Always Use a Spring Guide**
   - When using a spring guide, the coil spring may buckle or bend midway. This can cause it to fail since the internal surface of the bending is subjected to concentrated high stress. Be sure to use a spring guide, such as a shaft and an outer diameter guide, with the coil spring. In most cases, the best results are obtained by inserting a shaft all the way through to the top and bottom, as an inner diameter guide.

2. **Set up An Initial Deflection**
   - When there is a gap for the coil spring to move in vertically, it receives an impact force that causes it to bend midway or break. Setting up an initial deflection stabilizes the top and bottom ends of the spring.

3. **Avoid Entrapment of Debris or Foreign Matter**
   - Debris or foreign object that cannot be caught between the coils causes part of the coil spring to stop functioning as active coils, forcing the others to deflect, as shown in Fig.-3. This sharply reduces the number of active coils, increasing the stress on the spring, and eventually causing it to break. Be careful not to allow debris or foreign object to get onto the coils.

4. **Keep Mounting Faces Parallel**
   - Improper parallelism at the mounting surface can cause the spring to bend midway, subjecting the bend to high stress. This can cause the spring to break at the point. The same applies to the dies in which the coil spring is used. If the parallel alignment between the dies is poor, as shown in Fig. 4, the coil spring can bend midway or exceed the 300,000 times limit prematurely. Keep the coil spring mounting faces as perfectly parallel as possible to avoid the form occurring.

5. **Do not Use Coil Springs in Series**
   - If you use two coil springs in series, they will tend to bend, as shown in Fig. 5. This can cause them to move out at the shaft, counterbore holes if this happens, this coil spring will eventually break for the same reasons as described in above. Moreover, due to spring load differences, the weaker spring is overcome by and deflects more than, the stronger spring, as shown in Fig. 6. This will make the weaker spring more prone to damage, or cause it to break.

6. **Do not Use Two Coil Springs in Parallel**
   - Use of two coil springs in parallel, as shown in Fig.-7, may result in the inner coils being unbent, that is, the coil spring being forced to bend midway or break. Use of two coil springs in parallel, as shown in Fig.-8, may result in the inner coils being unbent, that is, the coil spring being forced to bend midway or break. Keep the coil spring mounting faces as perfectly parallel as possible to prevent this from occurring.

7. **Do not Use the Coil Spring Horizontally**
   - When the coil spring is used in horizontal direction, the internal surface of the spring will come in contact with the shaft, causing abrasion at these spots. The spring will eventually break at these weakened spots.