

Electrical & Mechanical Connections

Belleville Springs - Application Notes

Belleville spring, disc spring, conical compression washer are all names for the same type of spring (Figure 1). A Belleville spring is a conical shaped disc that will deflect (flatten) at a given rate. This spring rate is usually very high, allowing the spring to produce very large loads in a very small space.

Belleville springs are used in a variety of applications where high spring loads are required. They are particularly useful where vibration, differential thermal expansion, relaxation, and bolt creep are problems.

Belleville springs can be stacked in four different ways (Figure 2).

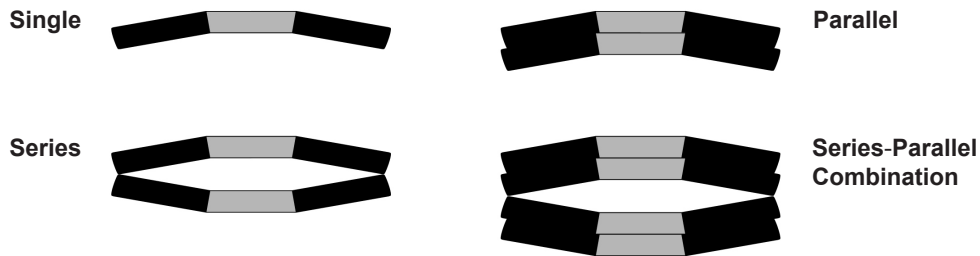


Figure 2

A single Belleville spring has a specific load and deflection. Belleville springs in stacked arrangements provide increased load and/or deflection. Two springs in parallel doubles the load at the deflection of one spring. Two springs in series doubles the deflection at the nominated load of one spring. (Figure 3)

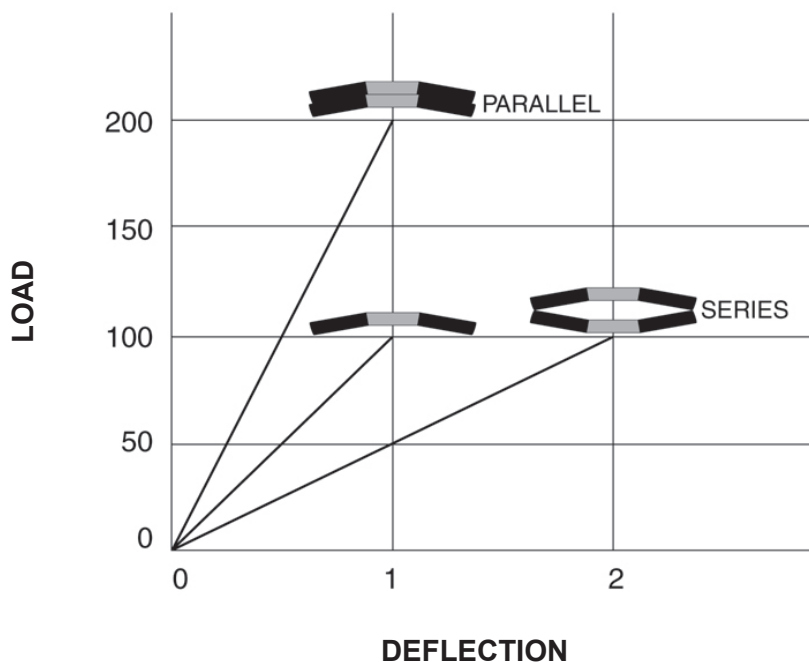


Figure 3



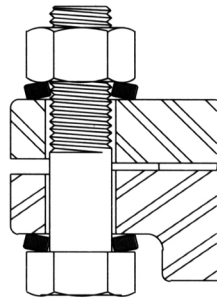
Electrical & Mechanical Connections

Belleville Springs - Application Notes

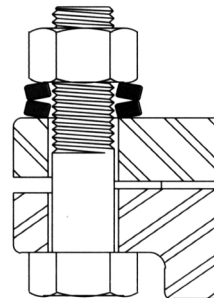
Installation:

Belleville springs must be utilised correctly in order to maximise their benefit. There are several important points when using Belleville springs.

- A. Be sure that the bolts are long enough to account for the thickness of the Belleville.
- B. The OD of the spring should contact the surface of the joint. The ID should contact the bolt head or nut.
- C. If a tensioner is used to preload the bolts, the Bellevilles must be on the opposite side of the joint.



Recommended



Not
Recommended

Figure 4

Figure 4 shows examples of the proper and improper way to install two Belleville springs in series.

Made by Solon Manufacturing Co