



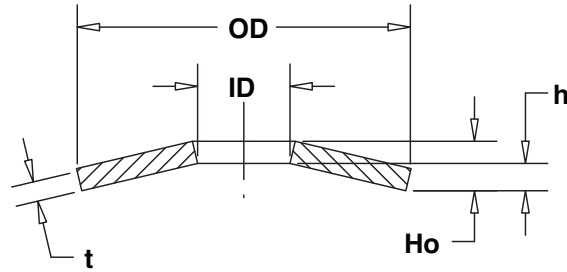
Belleville washers, also known as Belleville Springs, are a type of non-flat washer. They have a slight conical shape which gives the washer a spring characteristic. Belleville washers are typically used as springs when the application requires a high load in a small space. They are also used to apply a pre-load or flexible quality to a bolted joint. They may also be used as locking devices, but only in applications with low dynamic loads, such as down-tube shifters for bicycles. Belleville washers are seen on Formula One racing cars, as they provide extremely detailed tuning ability.

Multiple Belleville washers may be stacked to modify the spring constant or amount of deflection. Stacking in the same direction will add the spring constant in parallel, creating a stiffer joint (with the same deflection). Stacking in an alternating direction is the same as adding springs in series, resulting in a lower spring constant and greater deflection. Mixing and matching directions allow a specific spring constant and deflection capacity to be designed.

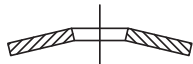
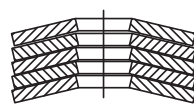
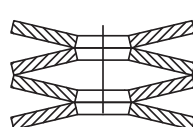
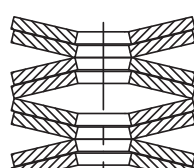
Comprehensive Capabilities

Materials:

- 1075 Carbon Steel • 1095 Carbon Steel
- Type 301 Stainless Steel • Type 316 Stainless Steel
- 17-7 Stainless Steel



ARRANGEMENT TYPE

<p>A. Single Disk</p>  <p>Load: _____</p> <p>@ <input type="checkbox"/> Deflection <input type="checkbox"/> Flat</p>	<p>B. Parallel</p>  <p>Disks: _____</p> <p>Load: _____</p> <p>@ <input type="checkbox"/> Deflection <input type="checkbox"/> Flat</p>	<p>C. Series</p>  <p>Disks: _____</p> <p>Load: _____</p> <p>@ <input type="checkbox"/> Deflection <input type="checkbox"/> Flat</p>	<p>D. Series-Parallel</p>  <p>Disks in Series: _____</p> <p>Disks in Parallel: _____</p> <p>Load: _____</p> <p>@ <input type="checkbox"/> Deflection <input type="checkbox"/> Flat</p>
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INDICATE UNITS OF MEASURE (IN. & LB.), (MM & KG)

1. MATERIAL _____
2. THICKNESS (t) _____
3. OD _____ +/- _____ OR WORKS IN _____
4. ID _____ +/- _____ OR WORKS OVER _____
5. HEIGHT (Ho) _____ +/- _____
6. (h) _____
7. (h/t) _____
8. ARRANGEMENT TYPE A B C D
9. STACK HEIGHT _____
10. OPERATING TEMP. _____ °F
11. FINISH _____
12. OTHER: _____

COMPANY: _____

ADDRESS: _____

CITY: _____

STATE: _____ ZIP: _____

CONTACT: _____

PHONE: _____

FAX: _____

EMAIL: _____

QUANTITIES TO BE QUOTED: _____

END USE OR APPLICATION: _____

