

# Precision Spring Products for the Aerospace Designer

**JOHN  
EVANS'  
SONS** Est. 1850

SPRINGS MADE BETTER™

When evaluating your aerospace equipment design, John Evans' Sons offers several counterbalance options to assist and/or enhance articulated instruments and assemblies.

Whether your design requires a counterbalance utilizing...

- Constant force springs
- Constant force spring motors
- Spiral torsion springs
- Spring reels

...the capabilities have significant benefits compared with traditional helical springs and gas springs.

**Constant Force Springs** provide a smooth range of motion and a constant load in either extending or retracting direction. This spring design has no inertia to overcome when considering the initial position starting forces. Constant force springs are compact and mount easily to existing hardware. Applications include counterbalancing of aircraft cargo doors, as well as interior and exterior aircraft motion control mechanisms.

#### **Constant Force Springs**

- Constant load
- Smooth range of motion
- Minimal starting force



Constant force springs, constant force spring motors and spiral torsion springs provide rotational energy to move or turn components in aerospace devices. Springs can eliminate costly and complicated motors decreasing your device size and cost.



**Spiral Torsion Springs** allow for rotation in 2 directions and a "return to center" capability. Used in pairs at right angle to each other, a wide range of motion can be achieved in two axis configuration, while still preserving the "return to center" feature. An example application of this is a flight control joystick control unit, as found in our various drone aircraft programs.

#### **Spiral Torsion Springs**

- Develops high torque
- Rotation in two directions
- Compact, easily mounts in many designs



Spiral torsion springs are normally used in applications requiring less than 360 degrees of rotation. They are generally used to obtain a large amount of torque through a small amount of rotation.

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**America's Spring Company**

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**Spring Powered Reels** (arbor mount or base mount) are available with a large range of forces, cable lengths, and travel. Spring powered reels mount easily, and with a pre-installed cables, attach quickly. These reels can be used to counterbalance hatches, doors, stairs, etc.

**Spring Powered Reels**

- Wide range of forces, cable lengths, and travel
- Mounts quickly and easily
- Metal and plastic available



Spring sub-assemblies may call for the use of components made of a variety of materials (molded plastic, machined metal, rubber). We frequently are able not only to produce the specialty spring, but then to assemble the spring and various customer designated or customer supplied additional parts into a completed sub-assembly. Often, it is cost-effective to consider sub-assembly at the point of spring manufacture, and in this approach, John Evans' excels.

**Helical Vibration Isolators**

- Extreme temperature operating range
- Impervious to ozone & most chemicals
- Almost infinite operational life



Our **Helical Vibration Isolators** are made of aircraft quality stainless steel cable, wound into metal retaining bars prepared for surface mounting. The wire rope (ranging in diameter from 1/16" to 1"+) and its helix configuration provide the specific resilience required to cushion fragile loads as small as a few pounds or substantial loads of many thousands of pounds, and absorb vibration through a wide frequency spectrum. The isolator operates well in any position: in compression, extension, shear, and roll. All-metal construction makes our isolators virtually impervious to severe environments, and maintenance free.



The primary application for our **Static Discharge Grounding Reels** is to protect aircraft and ground crews from static electricity during refueling and defueling. We manufacture many different reels for specific applications and all designs incorporate the military specification A-A-50696.

Other uses: the manufacturing of static sensitive electronics, for example: requiring the grounding of defense missiles during the manufacturing process. Many of these types of applications involve both mobile and stationary mounting of

**Static Discharge Grounding Reels**

- Stainless or galvanized steel cable in wide range of lengths and jacketing
- Complies with MIL spec. A-A-50696
- Enclosed, rubber gasketed rewind mechanism



John Evans' has a fully staffed Engineering department that is eager to discuss the design requirements and equipment counterbalancing challenges in your design and prototype phase.

In fact, many choices of counterbalances, springs and reels are stock items and can ship quickly to aid in your product evaluation.

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