

# World Leader in the Field of Shock & Vibration with Over 60 Years of Industry Experience: Taylor Devices

Taylor Devices was founded in 1955 by Paul H. TAYLOR, as the USA's leading independent manufacturer of energy management devices. The company has a long and rich history in the design and production of shock and vibration isolation products, including Dampers, Shock Observers, Vibration Isolators, Gun Mounts, Shock Transmission Devices, Fluid Springs, Air Springs, Machined Springs, Shock Isolation Systems and Satellite Deployment Systems, are fully certified by the U.S. Government, as well as NASA and various federal and corporate agencies. Their products have been utilized in aircraft, missiles, satellites, spacecraft, ships, submarines, radars, tracked vehicles, and gunnery systems.

Shock absorbers are something that we usually do not consider as an important part of everyday life, but they truly are essential with many different applications and are used on a wide range of commercial and military vehicles. They are also used in more than just vehicles, they are also used in bridges, highways and buildings to absorb the

impact from earthquakes and high winds. Different applications require different types of shocks and different materials. A rubber shock absorber cannot be used on a vehicle while a cylindrical shock absorber cannot be used on a highway. All the situations require a specific shape and type of shocks to be used for the required tasks.

Headquartered in North Tonawanda, New York, USA, Taylor Devices is spread out over two campuses (Tonawanda Facilities and Buffalo Bolt Way Facilities) encompassing 115,000 sq-ft that include offices, machine shop, paint shop, and packaging. While Taylor Devices maintains a wide array of standard products, all these products can be modified to customer specifications. Customized items include single or double acting dampers, non-linear dampers, single and double acting liquid springs, liquid die springs, tension shock absorbers, tension-compression shock absorbers, crane buffers, vibration dampers, machined springs, elastomer springs, gas springs, and custom actuators.



## Custom Vibration Isolation Systems Designed for Customer Needs

A shock and vibration isolation system provides protection against continuous or transient shock and vibration events. Mitigation often includes the integration of special hardware including shock absorbers, dampers, vibration isolators, shock isolators, shock transmission units, etc. A shock absorber or damper is a mechanical or hydraulic device designed to absorb and damp shock impulses and to remove harmful energy from a dynamic system. It does this by converting the kinetic energy of the shock into another form of energy (typically heat), which is then dissipated. Most shock absorbers are a form of dashpot (a damper which resists motion via viscous friction). Shock absorbers absorb a maximum amount

of kinetic energy and bring a moving mass to a stop with minimal force, whereas dampers continuously remove energy from a moving system to control its response.

Most shock and vibration isolation systems consist of a combination of some type of suspension elements (i.e. springs), and an optimized level of damping. Isolation systems are designed to operate along any desired plane or axis of motion, up to 6 degrees of freedom, thereby protecting the isolated payload in up to 3 translational axes and around 3 rotational axes of motion. Simple isolators with linear output characteristics will provide some level of protection across a given input frequency range. However, Taylor Devices provides specialized isolation systems that can provide higher levels of protection, thereby effectively reducing the energy input to the isolated equipment over a wider frequency bandwidth. The amount of damping that exists in the isolation system provides a trade-off between response at the resonant frequency of the system and the response at all other frequencies. A low damping level will generally provide a relatively low response over a wide bandwidth but a relatively high response at resonance. Conversely, a high



Zero-Maintenance Landing Gear Shock Absorbers



Recoil/Counter-recoil Absorbers & Controllers



*Shock Absorbers for Spaceflight and Ground Support Equipment*



*Taylor Devices Load Isolation System, International Space Station*

damping level will generally provide a low response at resonance but will sacrifice performance over the remaining frequency range. Other isolator nonlinearities such as friction can further sacrifice system performance.

## Shock and Vibration Isolation Systems for Military & Aerospace Applications

In the field of military land vehicles shock absorbers can be offered for both tracked and wheeled vehicles for almost all axle weights and wheel travel.

Whether handling sudden

blasts and shocks, or constant vibrations from energy sources, isolation systems are vital in the military and aerospace fields. When a shock and vibration environment is deemed to be intolerable for a certain system or piece of equipment, the issue must be addressed through discrete changes that will make the environment

acceptable. When this is not possible or practical, shock and vibration must be controlled by isolating the equipment, thereby providing protection to the equipment. Similarly, if the equipment itself is producing the shock and vibration, it may become desirable to mitigate this energy from the surrounding environment. Taylor Devices is capable of engineering custom military and aerospace vibration isolators that provide viable solutions to customers/end users' problems.

## Custom Landing Gears for the Aircraft & Unmanned Aerial Vehicles (UAVs)

Taylor Devices is in its seventh decade as a key supplier of custom-engineered arresting and landing gears to aircraft. They also provide components for UAV manufacturers that require a maintenance free system that can operate in the harshest of environments, with an established track record of success. Their products meet strict environmental and precision requirements as demanded by the industry.

Taylor Devices' landing gear systems use a non-pressurized design that is inherently safer and capable of operating at the most

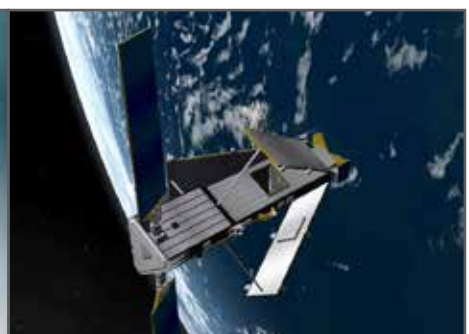
extreme of temperatures. Its lightweight and compact design allows for a greater payload and increased aircraft range at a reduced cost, with increased durability and performance when compared to conventional landing gear systems. Design solutions are custom tailored to customer requirements and are limited only by the imagination.

## Dampers and Shock Absorbers for Space Applications

Taylor Devices has a long history of working with NASA (National Aeronautics and Space Administration) beginning in the 1960s on the Apollo Program, where engineers developed shock absorbers for ground equipment on the launch platform. From there, the company has been successful in developing many other types of actuators and shock absorbers for spaceflight, including the use of metal blows on spacecraft, isolation system for the space shuttle launch pad, vibration isolation systems on launch platforms and in spaceflight, and more. Taylor Devices is committed to designing and building shock absorbers that can be used for future moon landings, spaceflight applications, and other ground support equipment.



*6 Degree of Freedom Isolation Systems*



*Actuators and Dampers for Spaceflight*