

KINETICS™

Vibration Isolation for CMM Systems

Kinetics Noise Control has been at the forefront of vibration isolation technology since its inception as Consolidated Kinetics Corporation in 1958. Since 1980, Kinetics' has provided isolation systems for over 250 Coordinate Measuring Machines (CMM) located in critical industrial areas. Kinetics' systems approach, its standard of excellence in engineering, design, and product fabrication, as well as its thorough understanding of CMM technology and application, sets it apart from firms who only sell products.

Kinetics systems include:

- 1) Vibration Isolators:
 - a. Active Air Supports
 - b. Pneumatic, with internal damping
 - c. Steel Spring Isolators
 - d. Elastomeric Pads
 - e. Or any combination
- 2) Pneumatic Leveling Devices
(if necessary)
- 3) Equipment Foundations,
and Inertia Bases:
 - a. Structural Steel
 - b. Prefabricated Reinforced Concrete
 - c. Poured-In-Place Concrete

Kinetics Noise Control has the experience and capability to handle every phase of CMM installation. Our engineers have worked with virtually every CMM manufacturer, ranging from small tabletop installations to large machines in excess 66 feet (20 meters) in length.



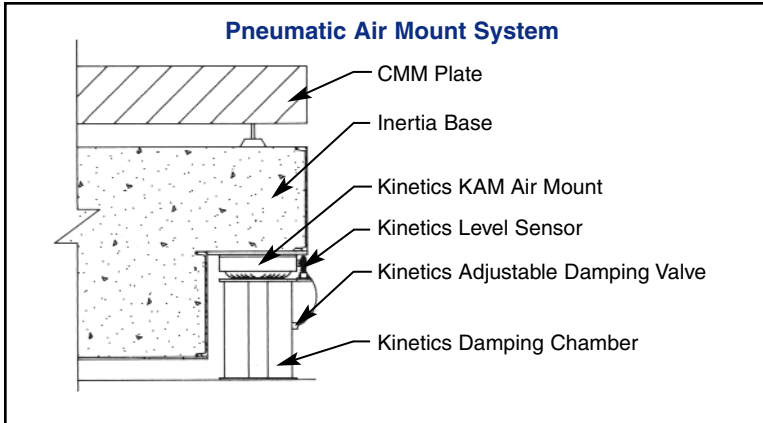
Single Arm CMM on Air Support Inertia Base with Removable Isolator Access Plates

Vibration Analysis

A very important part of any vibration isolation system is the accurate determination of the background environmental ground-borne vibration levels. The frequency, magnitude, and orientation of the vibration levels must be determined at the proposed location of the CMM. The measured vibration levels are then compared with the CMM manufacturer's vibration criteria. This comparison will determine the specific isolation requirements which the vibration isolation system must provide.

Vibration measurements must be made over a sufficiently long period of time so that all vibration sources are measured, including overhead cranes, material-handling systems, process equipment, etc. The field measurement instrumentation must have the capability to measure accurately to 1 Hz and in all 3 axes.

Kinetics provides onsite vibration analysis as a low cost service for our customers. Low-frequency seismic recording devices are used which are capable of accurately determining low-frequency vibration. Field data is analyzed, compared, and presented in report form with full backup documentation.



Air Spring Isolation Systems

In installations requiring maximum reduction of low frequency vibration, Kinetics offers single and double bellow air springs. Kinetics Model KAM air springs have vertical natural frequencies as low as 2.0 Hz, and 1.5 Hz horizontal natural frequencies. Individual air spring capacities range from 1,000 lbs. to 28,000 lbs. (454 kg to 12.7t), and multiple mounts can be used to support almost any load.

Kinetics' air spring systems can be designed with adjustable damping chambers. A patented automatic level control system keeps the supported equipment level to within 0.03" (750 microns) under changing load conditions.

As an option, air spring systems can be provided with a control panel, which monitors system pressure, includes air-filtering devices, and can provide an air lock system that keeps the isolators inflated if shop air or electricity should become interrupted.

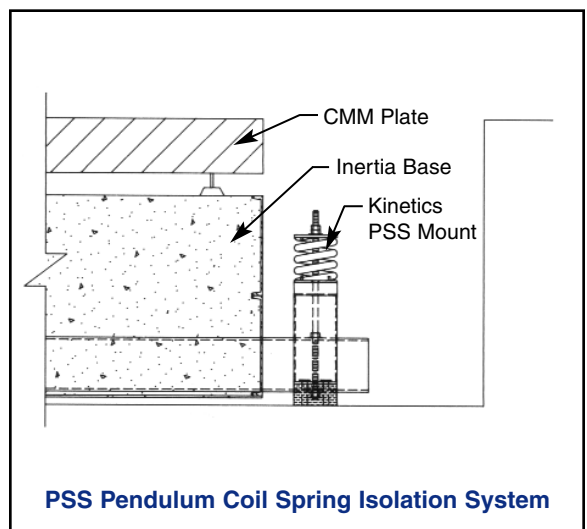


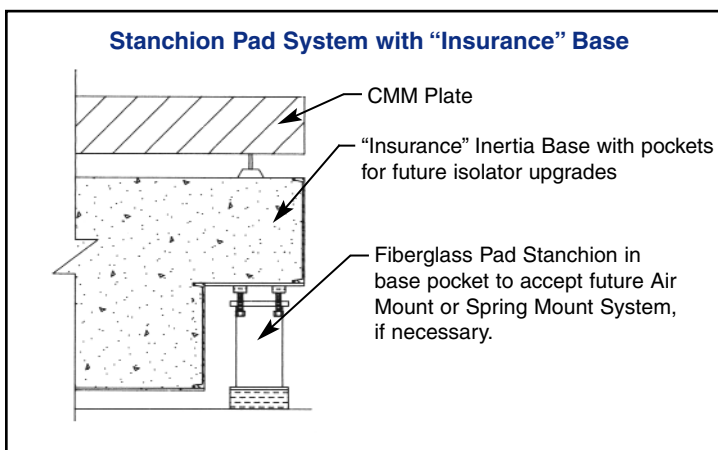
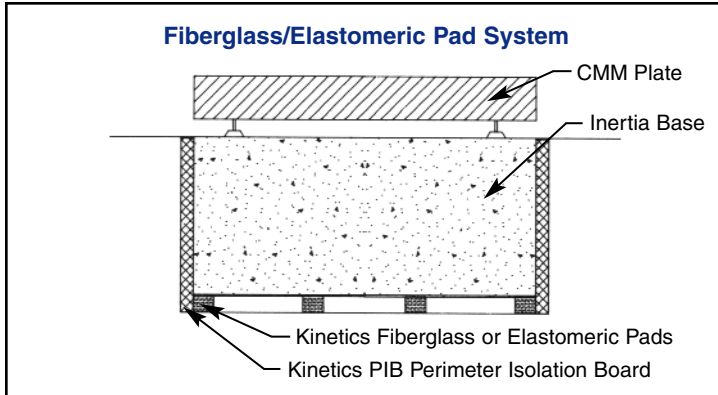
Steel Coil Spring Isolation Systems

In installations requiring steel coil spring isolation systems, Kinetics offers a variety of isolators from 1" to 4" (25 mm to 102 mm) static deflection and up to 10,000 lb. (4,536 kg) capacity. For higher deflections and larger capacities, custom-wound springs are available.

All of Kinetics' steel coil spring isolators have high horizontal stiffness for increased stability and minimum of 50% overload load carrying capacity while still maintaining safe coil stresses.

Kinetics' steel spring isolators are complete with leveling adjustment and are offered in several configurations. Our pendulum coil spring design, Model PSS (shown above), provides an extremely stable, low horizontal spring rate isolator for applications where system stability is critical. Kinetics' steel coil spring isolation systems can also be provided with supplementary air spring helper springs incorporating automatic leveling to maintain position to within 0.001" (25 microns) under changing load conditions.





Active Isolation Systems

Bridge CMMs up to 10 feet (3 meters) long utilize our AIS pneumatic isolator with internal damping. This isolator has a level control and the internal damping helps settling as the bridge travels from one end to another. See the spec sheet for the Model AIS 2500 Isolator.

Fiberglass Pad Isolation Systems

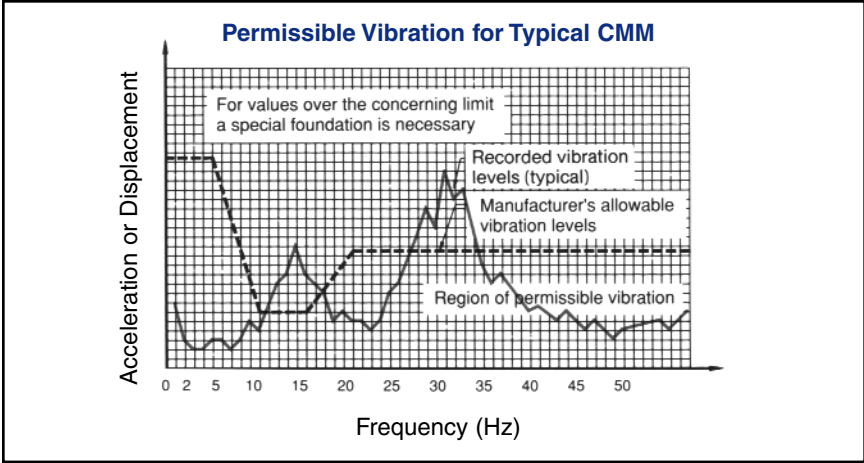
In installations where there is little or no low frequency vibration, Kinetics Noise Control's cast-in-place Fiberglass Pad Isolation Systems are available. Fiberglass pad isolators are far superior to Elastomeric and other organic pad isolation material. Fiberglass isolation media is unique in that the natural frequency is constant over a wide operating range because the stiffness increases proportionately with applied load. Fiberglass pads are available in varying densities to support loads from 10-400 psi (0.7 to 27.6 bars). Fiberglass isolation pads do not alter their spring rate over time, as do elastomeric isolation pads. A flexible elastomeric coating allows the pad to be unaffected by hazardous environments such as dirt, oils, etc. Pads can be configured for natural frequencies down to 5 Hz.

Elastomeric Pad Isolation Systems

To protect sensitive precision equipment against floor-borne vibrations Kinetics' Elastomeric Pad Isolation Systems can be used. Elastomeric Pad Isolation Systems support sensitive equipment away from structure-borne vibration, which might otherwise disturb the operation of the equipment. The low natural frequency of Elastomeric Pad Isolation Systems compares favorably with conventional steel or air spring isolators. These systems are completely passive and require no maintenance after installation.

"Insurance" Isolation Systems

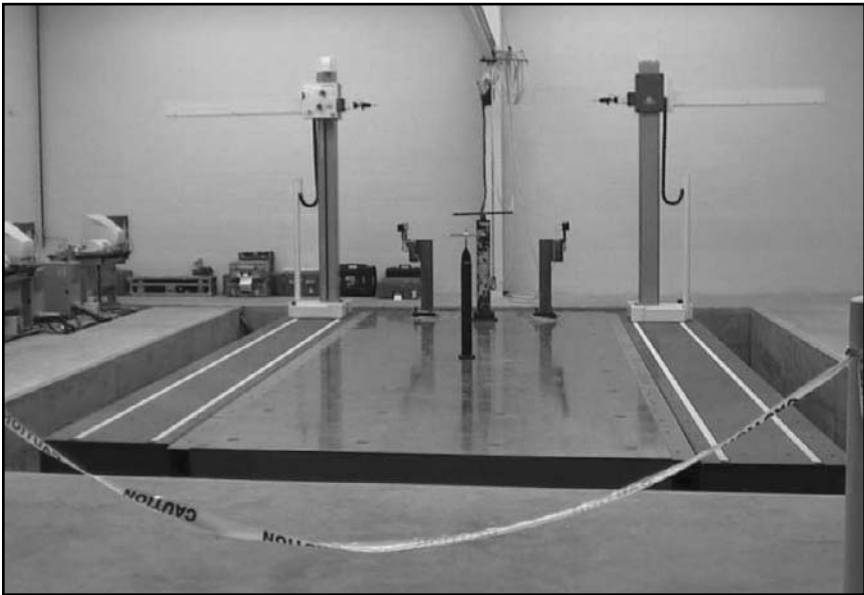
For new facilities, sites where vibration sources may not be operating, or where additional equipment may be installed after the CMM is operational, Kinetics offers an "insurance" isolation system. The system consists of an equipment foundation and isolation system designed to control existing or anticipated vibration sources. It is most often an elastomeric pad system with pads on stanchions installed in a base pocket. This construction lowers the effective center of gravity with respect to the isolation system to increase stability. If future requirements call for a more efficient system, air springs can easily be installed in place of the isolation pads without disruption of CMM usage.



CMM Isolation Design and Installation

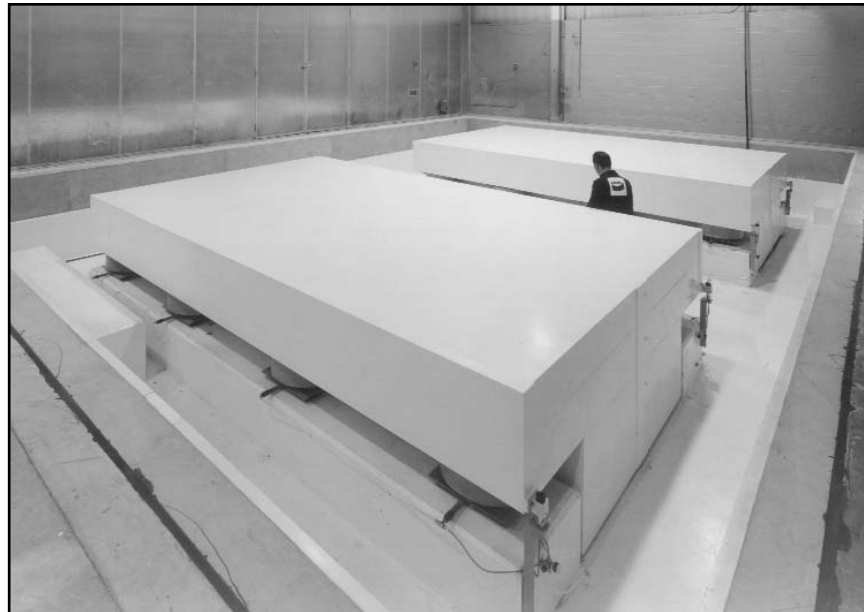
An extremely critical phase of CMM isolation design is initial field vibration analysis of anticipated site location ambient conditions. Kinetics uses state-of-the-art vibration monitoring and analysis equipment for accurately measuring structural vibration down to 1 Hz.

Proprietary computer software allows rapid analysis of many thousands of data points. Data is then compared with the CMM manufacturers' allowable vibration criteria so that a suitable isolation system can be designed.



When the basic parameters of the isolation system have been established, engineers at Kinetics perform dynamic and structural analysis to assure that foundation size and stiffness are adequate. Design checks are made to optimize horizontal and vertical stability, equipment level and orientation, foundation deflection, and settlement times.

Kinetics offers complete turnkey project management or installation supervision. All Kinetics' systems require little maintenance and offer low operating costs.



United States	Canada
6300 Irelan Place	1720 Meyerside Drive
P.O. Box 655	Mississauga, Ontario
Dublin, Ohio 43017	L5T 1A3
Phone: 614-889-0480	Phone: 905-670-4922
Fax: 614-889-0540	Fax: 905-670-1698

www.kineticsnoise.com
sales@kineticsnoise.com

Kinetics Noise Control, Inc. is continually upgrading the quality of our products. We reserve the right to make changes to this and all products without notice.