



# HERZAN SOLUTIONS GUIDE

## OVERVIEW

For over two decades, Herzan's mission has been to help researchers maximize the quality of data collected by their instrumentation. To achieve this goal, Herzan has designed industry-leading environmental solutions to isolate acoustic, vibration, and EMI noise under any ambient conditions.

Herzan's catalog of environmental solutions focus on three critical areas: unmatched isolation performance, application-tailored design, and premium production quality. These three areas drive product design at Herzan and continue to be the reason why users feel confident in recommending Herzan products to their colleagues when searching for the right environmental solution.



## HERZAN SOLUTIONS

### Solutions for Vibration Noise

- Modular Active Vibration Isolation Platforms
- Desktop Active Vibration Isolation Table
- Desktop Passive Vibration Isolation Table
- Custom Vibration Isolation Workstations

### Solutions for Acoustic Noise

- Desktop Acoustic Enclosures
- Workstation Acoustic Enclosures
- Paneled/Modular Acoustic Enclosures

### Solutions for EMI Noise

- Magnetic Active Cancellation System
- Custom Faraday Cages

### Solutions for Site Analysis

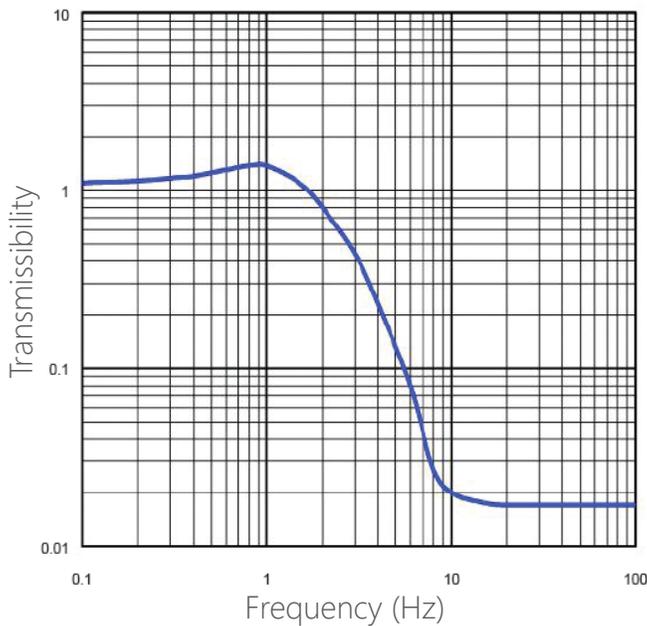
- The WaveCatcher



**PROBLEM:** Vibration Noise  
**SOLUTION:** Modular/Scalable Active  
Vibration Isolation Platforms (AVI Series)



## TRANSMISSIBILITY



## PERFORMANCE

The performance graph is to be considered for all AVI Series platforms. The transmissibility graph is a conservative estimate of performance in any given lab environment and pertains to all six translational and rotational modes of vibration (all six degrees of freedom).

### Performance Details

- Active Vibration Isolation from 1 - 200 Hz (performance upgrades available: the LFS System)
- Passive Vibration Isolation from 200 Hz and beyond
- 90% Vibration Attenuation at 5.5 Hz
- 99% Vibration Attenuation at 10 Hz and beyond

## OVERVIEW

The AVI Series is a modular, low profile, active vibration isolation platform that achieves sub-hertz isolation performance across all six degrees of freedom. The AVI Series is available in three standard sizes (AVI-200, AVI-400, and AVI-600) to accommodate instruments of all shapes and sizes (from 0 - 9,000 Kg).

The isolation technology within the AVI Series consists of piezoelectric vibration sensors, control electronics, and actuators, which dynamically respond to vibrations within the environment and provide an attenuated signal to the top plate of the isolators.

The seamless installation process and lack of persistent maintenance of the AVI Series allows users to save money on installation costs while also saving time to focus on their research rather than their vibration isolation platform.

## FEATURES

- Active Isolation from 1 to 200 Hz
- Passive Isolation Beyond 200 Hz
- Isolates in all six degrees of freedom
- Internal feedback loop
- Compact, modular form factor
- Easy to install and simple to use

## APPLICATIONS

- Atomic Force Microscopy
- Scanning Probe Microscopy
- Electron Microscopy
- Tribology
- Profilometry
- And More!



**PROBLEM:** Vibration Noise  
**SOLUTION:** Desktop Active  
Vibration Isolation Table (TS Series)



**OVERVIEW**

The TS Series is the industry leader in vibration isolation performance and usability, delivering sub-hertz isolation (all 6 DOF) in a plug-and-play form factor. The TS Series utilizes the same isolation technology found in the AVI Series, but is designed to accommodate the fast-paced environment of the modern research lab by making the usability and installation process seamless.

With several unique features setting itself apart from competing solutions (e.g. automatic leveling, LCD Display, External vibration monitoring), the TS Series becomes the perfect solution for users wanting to achieve the best vibration isolation performance available, while not sacrificing on design or functionality.

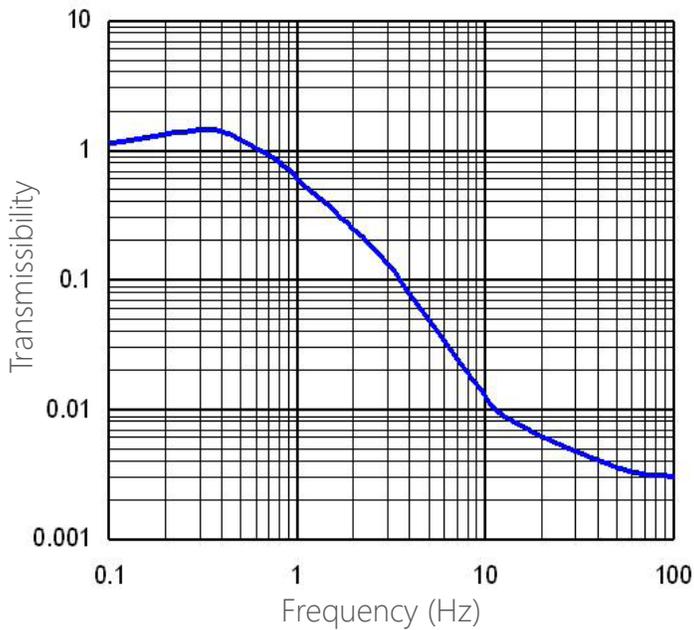
**FEATURES**

- Active Isolation from 0.7 to 1,000 Hz
- Passive Isolation Beyond 1,000 Hz
- Isolates in all six degrees of freedom
- Internal feedback loop
- Automatic Load Adjustment
- Plug-and-play installation
- Easy to install and simple to use

**APPLICATIONS**

- Atomic Force Microscopy
- Scanning Probe Microscopy
- Interferometry
- Profilometry
- And More!

**TRANSMISSIBILITY**



**PERFORMANCE**

The performance graph is to be considered for all TS Series tables. The transmissibility graph is a conservative estimate of performance in any given lab environment and pertains to all six translational and rotational modes of vibration (all six degrees of freedom).

*Performance Details*

- Active Vibration Isolation from 0.7 - 1,000 Hz
- Passive Vibration Isolation from 1,000 Hz and beyond
- 90% Vibration Attenuation at 3.5 Hz
- 99% Vibration Attenuation at 10 Hz and beyond





**Internal Dimensions (W x D x H):** 17.4 x 19.8 x 32.5 inches /  
**External Dimensions (W x D x H):** 20.1 x 24.1 x 36.3 inches

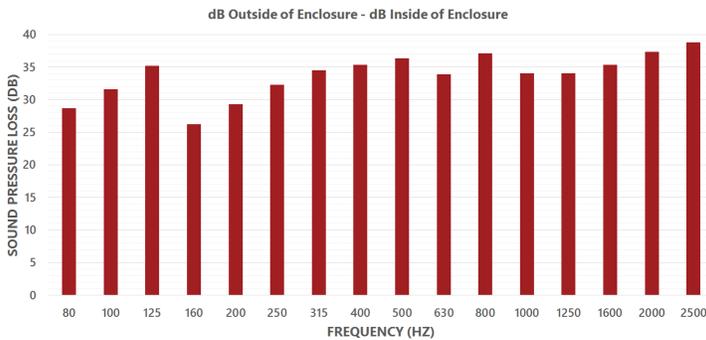
## **PROBLEM:** Acoustic Noise **SOLUTION:** Desktop Acoustic Enclosure (the Silencer)

### **OVERVIEW**

Herzan desktop acoustic enclosures are designed to fit on top of existing laboratory workstations or desks, freeing up valuable space within the lab for other research equipment. The most popular Herzan desktop acoustic enclosure is the Silencer, which allows for compact microscopes sensitive to acoustic noise (e.g. AFMs) to receive the same industry leading isolation performance provided by Herzan's workstation acoustic enclosures.

The Silencer and other desktop acoustic enclosures include the same proprietary isolation technology found in all Herzan enclosures and can be easily customized to suit the individual needs of a research application. With custom sizes and form factors available, Herzan desktop acoustic enclosures become the preferred solution for researchers unable to dedicate significant space within their lab to a much needed acoustic isolation solution.

### **ACOUSTIC ISOLATION PERFORMANCE**



### **PERFORMANCE**

The multi-layered, variable density material lining the inside of the Silencer allows for the highest performing acoustic isolation performance across a broad frequency spectrum.

#### *Performance Highlights*

- 32 dB of sound loss at 100 Hz
- 36 dB of sound loss at 500 Hz
- 34 dB of sound loss at 1,000 Hz
- 37 dB of sound loss at 2,000 Hz

### **FEATURES**

- Multiple layers of sound-damping material ensure broad frequency noise isolation
- Upgrades for environmental, usability and accessibility features available
- Reversible front door for increased ease of access and maneuverability allows research to become seamless
- Compact form factor saves valuable space within the lab

### **APPLICATIONS**

- Atomic Force Microscopy
- Scanning Probe Microscopy
- Acoustic Testing Applications
- High Precision Metrology
- And More!



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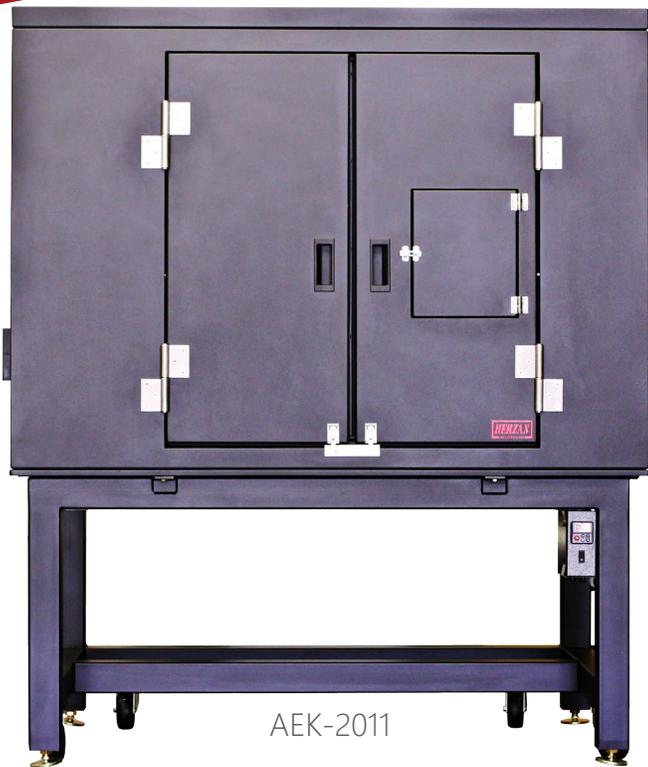
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**PROBLEM:** Acoustic Noise  
**SOLUTION:** Workstation Acoustic Enclosure (AEK-2002, Crypt, AEK-2011, etc.)

**OVERVIEW**

Herzan workstation acoustic enclosures have become the preferred solution for precision research microscopes needing top-of-the-line isolation performance in a form factor designed around the needs of their instrument. Herzan workstation enclosures have many standard sizes and form factors (e.g. AEK-2002, the Crypt, AEK-2011, etc.), but the opportunities to customize the design of the enclosure are endless, with many of the enclosures sold unique to the researcher.

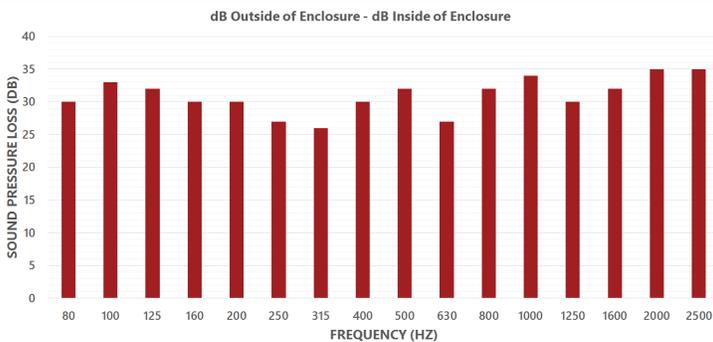
In addition to customizing the design of every enclosure, researchers have the opportunity to include a wide range of upgrade features, making the enclosure truly tailored to the individual research requirements.



AEK-2011

**Internal Dimensions (W x D x H):** 54.2 x 37x 40 inches /  
**External Dimensions (W x D x H):** 61.5 x 40 x 73 inches

**ACOUSTIC ISOLATION PERFORMANCE**



**PERFORMANCE**

The multi-layered, variable density material lining the inside of Herzan’s workstation enclosures allows for the highest performing acoustic isolation performance across a broad frequency spectrum.

*Performance Highlights*

- 33 dB of sound loss at 100 Hz
- 32 dB of sound loss at 500 Hz
- 34 dB of sound loss at 1,000 Hz
- 35 dB of sound loss at 2,000 Hz

**FEATURES**

- Designed for ultra-sensitive instruments and applications
- Multiple layers of sound-damping material ensure broad frequency noise isolation
- Upgrades for environmental, usability and accessibility features available
- Ease of access and maneuverability allows research to become seamless

**APPLICATIONS**

- Atomic Force Microscopy / Scanning Probe Microscopy
- Optical Microscopy
- Optical and Stylus Profilometry
- Acoustic Testing Applications
- High Precision Metrology
- And More!





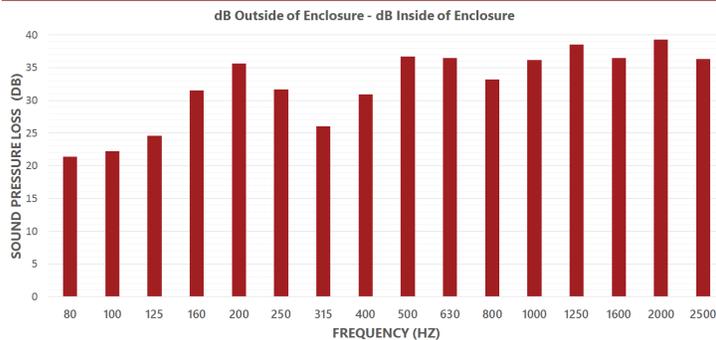
**PROBLEM:** Acoustic Noise  
**SOLUTION:** Modular/Paneled EM Acoustic Enclosure

Utilizing a modular panel design, Herzan's acoustic enclosures for electron microscopes provides the most acoustically sound environment possible, while being easy to operate and simple to maintain.

Each enclosure comprises of numerous variable density layers with carefully chosen high quality components to optimize acoustic dampening performance throughout the broad frequency spectrum.

Herzan carefully articulates the design of every EM acoustic enclosure to represent the specific needs of each application. Incorporating accessibility and form factor accommodations unique to each lab environment, Herzan's modular and paneled acoustic enclosures deliver a premier solution for a great value.

**ACOUSTIC ISOLATION PERFORMANCE**



**PERFORMANCE**

The multi-layered, variable density material lining the inside of the Silencer allows for the highest performing acoustic isolation performance across a broad frequency spectrum.

*Performance Details*

- 22 dB of sound loss at 100 Hz
- 36 dB of sound loss at 500 Hz
- 36 dB of sound loss at 1,000 Hz
- 35 dB of sound loss at 1,500 Hz
- 39 dB of sound loss at 2,000 Hz

**FEATURES**

- Designed to protect ultra-sensitive instruments and applications from acoustic noise
- Constructed with multiple layers of sound-dampening material to ensure isolation of high and low frequency acoustic noise
- Engineered to maximize space efficiency within the lab through compact construction
- Upgrades for usability, environmental, and accessibility features available!

**APPLICATIONS**

- Electron Microscopy
- Semiconductor Equipment
- Large Instruments Sensitive to Acoustic Noise



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**PROBLEM:** EMI Noise  
**SOLUTION:** Magnetic Field Cancellation System (Spicer System)



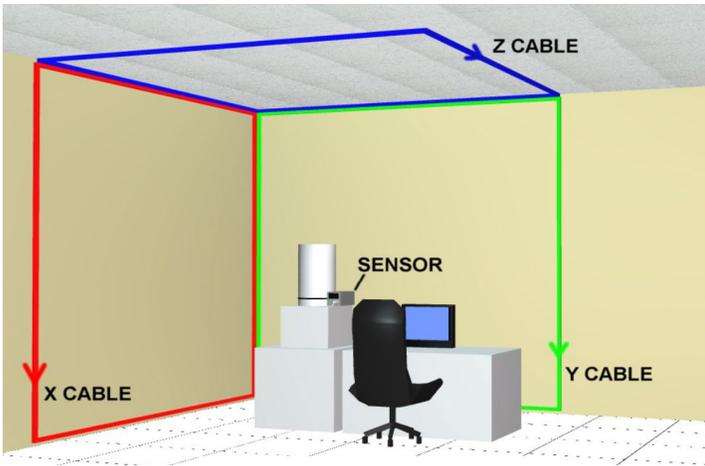
Herzan supplies industry leading active EMI cancellation systems to combat intrusive EMI noise from disturbing research performed by electron microscopes.

The Spicer magnetic field cancellation system provides cost-effective, maintenance-free, environmental magnetic field shielding for high resolution electron microscopes. The Spicer System delivers premier cancellation for both AC and DC fields from 0.001 - 1,000 Hz, providing over 30 dB of broadband EMI reduction.

The Spicer System broadens the available installation locations for EMs by allowing them to be placed in locations where varying high magnetic fields are present. As a result, they can be installed at sites that have been previously rejected due to magnetic field interference.

**TECHNICAL SPECIFICATIONS**

- Components cancelled: X, Y, & Z field components
- Measurement range (X&Y): 60 mG (6  $\mu$ T) pk-pk
- Measurement range (Z): 45 mG (4.5  $\mu$ T) pk-pk
- Field Cancelling Factor: 50x at 50/60 Hz
- Bandwidth: 2.5 Hz - 5,000 Hz
- System 1/f noise limit below 0.1Hz: <100  $\mu$ G (10 nT) pk-pk
- System wideband noise limit: 1  $\mu$ G (100pT) RMS 5 Hz - 20 kHz



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# **PROBLEM:** Unknown Environment When Installing New Microscope

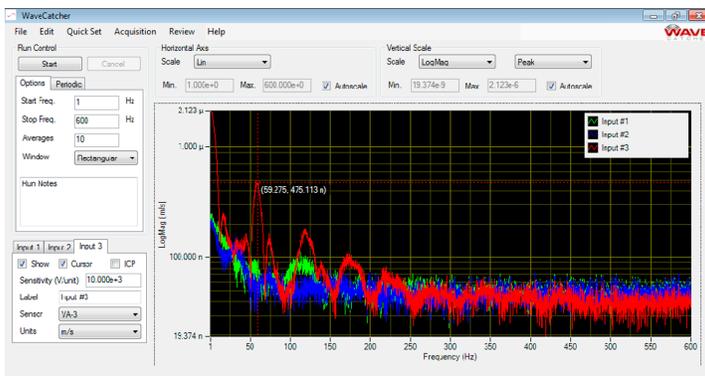
## **SOLUTION:** Site Survey Tools/Services



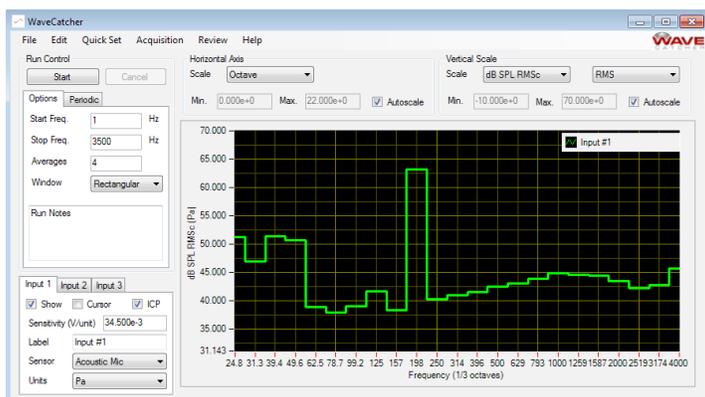
**Site Survey Tools:** The WaveCatcher is Herzan's compact and complete, mobile site analysis tool that can measure all forms of environmental noise (acoustic, vibration, and EMI) with a push of a button.

The WaveCatcher is the perfect solution for field service engineers, development planners, instrument manufacturers, and others who are interested in characterizing their environment prior to the installation of precision research equipment or during the planning stages of a lab. Features include:

- Perform precise vibration, acoustic, and EMI data measurements with the push of a button
- Create user-friendly site surveys
- Highly portable and easy to assemble
- Grab your kit and go
- Measure performance of environmental isolation solutions on-the-go



**Services:** Herzan also utilizes the WaveCatcher to provide site survey analysis and reports for customers requiring investigative analysis of their environment prior to the arrival of an electron microscope.



An Environmental Specialist from Herzan will visit a customer's site, perform extensive measurements and submit a report with the collected data and recommendations to optimize environmental conditions for upcoming instruments.



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