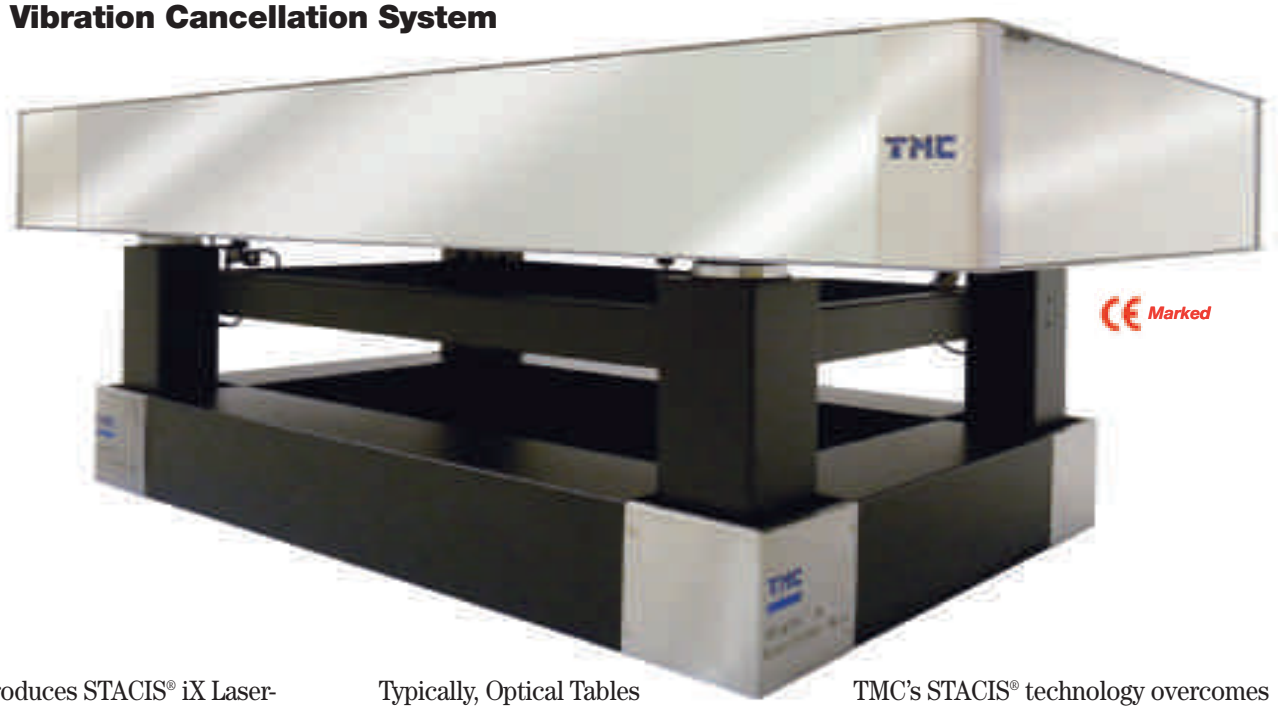
STACIS® iX LaserTable-Base™

NEW From TMC!
U.S. Patent Nos. 5,660,255, 5,823,307, Other Patents Pending

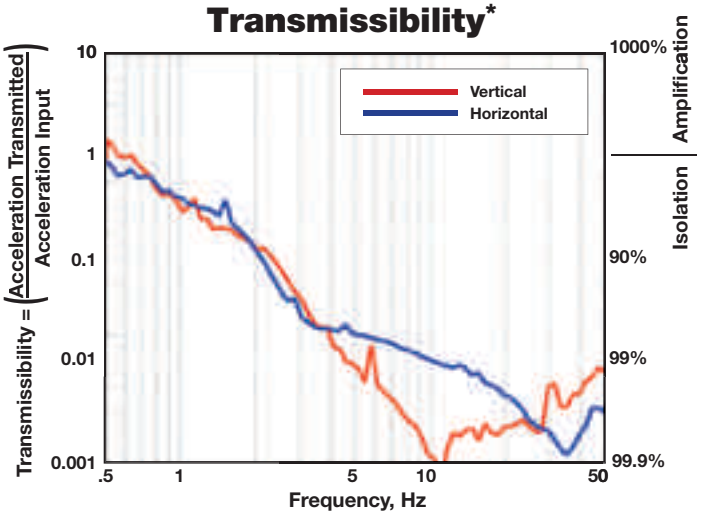
Hybrid Piezoelectric/Air Active Vibration Cancellation System



TMC introduces STACIS® iX LaserTable-Base™, the latest addition to our STACIS® iX line of piezoelectric active vibration cancellation systems. LaserTable-Base offers an extraordinary level of improvement over existing technology in the amount of vibration isolation attainable with an Optical Table.

Typically, Optical Tables are supported by low-frequency pneumatic vibration isolation systems. Though very effective at isolating high frequencies, these passive systems actually amplify vibration in the critical 1 to 3 Hz range.

TMC's STACIS® technology overcomes these limitations through a patented technology which incorporates piezoelectric actuators and inertial vibration sensors to cancel, not amplify, very low-frequency vibration.



** 4,000 lb (1,800 kg) capacity LaserTable-Base™ with MaxDamp® Isolation System. Payload of 2,000 lbs (907 kg), tested with simulated floor vibration at VC-A (2,000 micro-inches per second, 50 microns per second).*

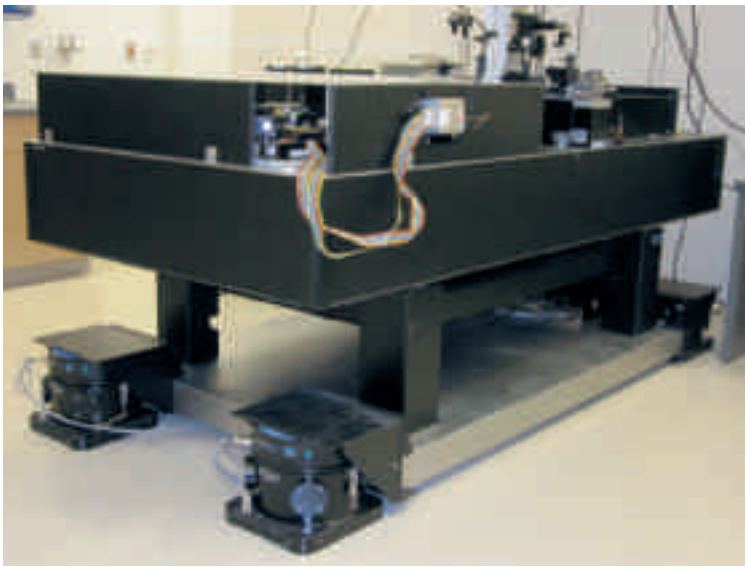
Features

- Incorporates patented STACIS® technology
- Active inertial vibration cancellation system
- Vibration cancellation starts below 1 Hz
- Extended stroke piezoelectric actuators, up to 60 microns
- 6 active degrees-of-freedom
- Consists of two isolation systems in series for maximum vibration cancellation
- Incorporates patented MaxDamp® Air Isolators
- Simple, robust, and cost-effective
- Installs easily, minimal tuning required
- Optional shelves for mounting equipment under the table
- Includes TMC's DC-2000 Digital Controller

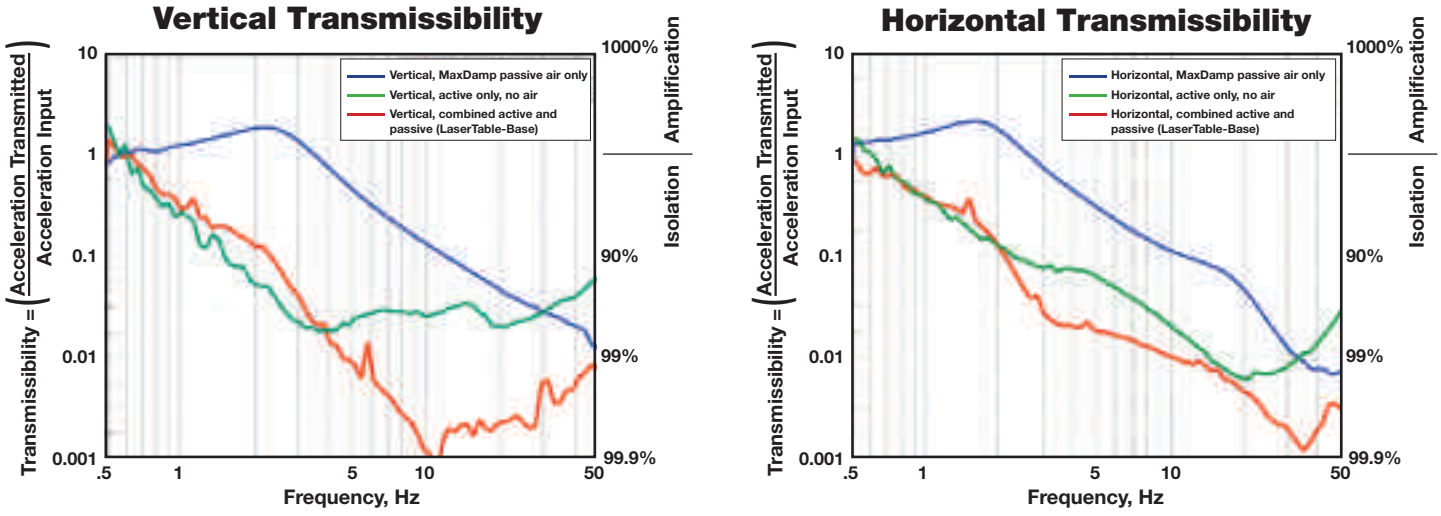
LaserTable-Base™ combines these two technologies, air and STACIS®, into one integrated cancellation system. The result is vibration cancellation at very low frequencies and unprecedented levels of high-frequency isolation due to the combined effect of two isolation systems in series.

Furthermore, STACIS® iX improves upon the original STACIS technology by the addition of extended travel piezo-electric actuators (to accommodate even the worst floors) and an updated design that significantly lowers total cost.

The upper pneumatic portion of LaserTable-Base consists of patented MaxDamp® Air Isolators. The modular design allows for customizing the air sub system for specific application requirements.



Until recently, researchers desiring the quietest possible vibration environment in a lab combined two independent products into a two-stage isolation system. This photo shows a 784 Series CleanTop® Optical Top supported by Gimbal Piston™ Air Isolators. This air isolation system is, in turn, supported on a 65 Series Floor Platform cradled with STACIS® 2100 Isolators. LaserTable-Base™ now combines these two independent isolators into one, integrated system.

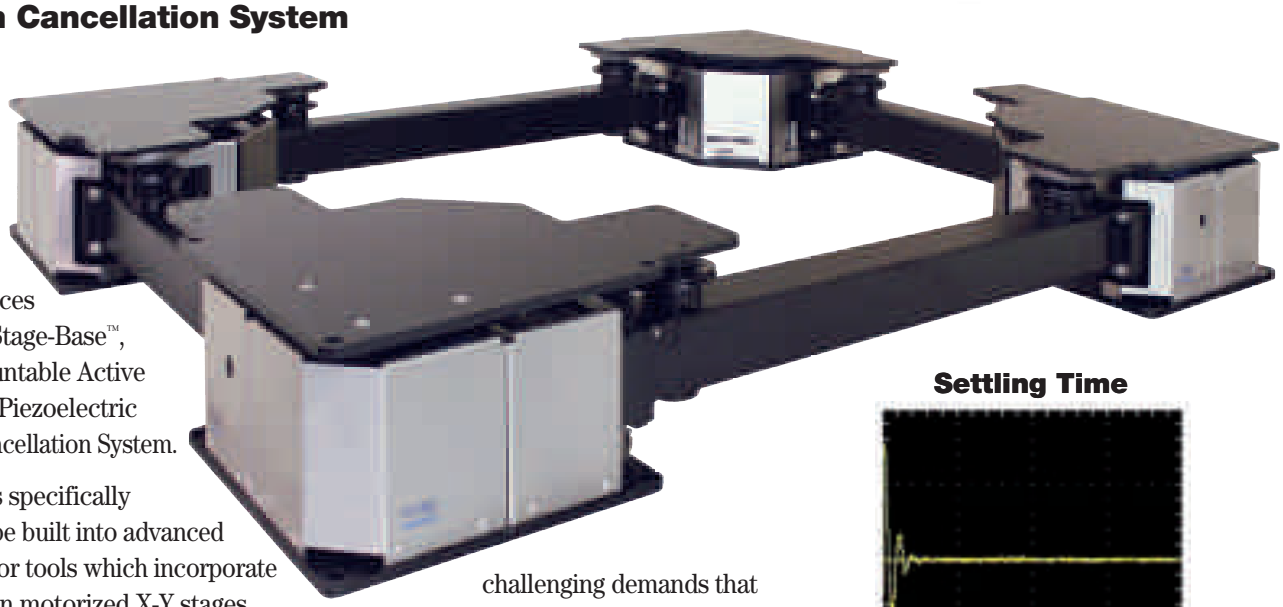


Combining the low frequency, passive MaxDamp® Air Isolators with a Piezoelectric Active Vibration Cancellation System in series results in an overall transmissibility curve that is the sum of the two individual transmissibility curves. The resultant vibration isolation performance is so dramatic that over some frequency ranges, we are limited by measurement instrumentation noise-floors and unable to measure and demonstrate the full isolation performance. That is, above 10 to 12 Hz, the actual performance of the combined system is expected to exceed that shown since the combined isolation is theoretically the sum of the isolation provided by the two sub-systems.

STACIS® iX Stage-Base™

NEW From TMC!
U.S. Patent Nos. 5,660,255, 5,823,307, Other Patents Pending

Frame Mountable Active Hard-Mount Piezoelectric Vibration Cancellation System



TMC introduces STACIS® iX Stage-Base™, a Frame Mountable Active Hard-Mount Piezoelectric Vibration Cancellation System.

Stage-Base is specifically designed to be built into advanced semiconductor tools which incorporate high precision motorized X-Y stages. Such tools require extremely efficient vibration isolation. But, just as critical, these tools require that payload motion induced by the stage settle very quickly so as not to adversely impact tool throughput.

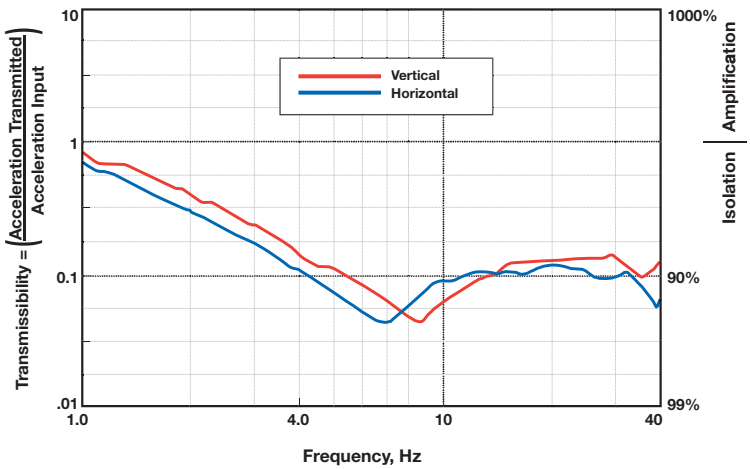
Stage-Base incorporates TMC's patented STACIS® technology to achieve extremely efficient vibration isolation using piezoelectric actuators and a stiff suspension.

TMC continues to apply advancing technology to develop new solutions to the challenging demands that semiconductor tools place on their vibration isolation systems. Stage-Base provides vibration isolation comparable to our STACIS active piezoelectric vibration cancellation systems but is specifically designed to be the primary isolation system incorporated inside the tool.

Stage-Base features extended stroke piezoelectric actuators, fast settling time in response to stage motion, and a hard-mount suspension with no soft air springs. It is available in 6 degrees-of-freedom and starts to isolate well below 1 Hz.

Settling Time

Transmissibility*



* 2,150 lb. (980 KG) payload with simulated floor vibration at VC-E (125 micro-inches per second, 3 microns per second)

Features

- Incorporates patented STACIS® technology
- Extended stroke piezoelectric actuators, up to 60 microns
- Position repeatability of payload to within microns
- Frame-mountable design
- 6 active degrees-of-freedom
- No feedforward required
- Active inertial vibration cancellation system
- Fast settling time in response to stage motion
- No soft air suspension
- Simple, robust, and cost-effective

STACIS® iX SEM-Base™

Active Piezoelectric Vibration Cancellation Floor Platform for Scanning Electron Microscopes

NEW From TMC!
U.S. Patent Nos. 5,660,255, 5,823,307, Other Patents Pending

STACIS® iX SEM-Base™ active vibration cancellation floor platform system is designed for use with scanning electron microscopes (SEMs). SEMs are among the most vibration sensitive tools made, and these precision instruments typically incorporate an internal vibration isolation system. SEM-Base is compatible with all internal SEM vibration isolation systems.

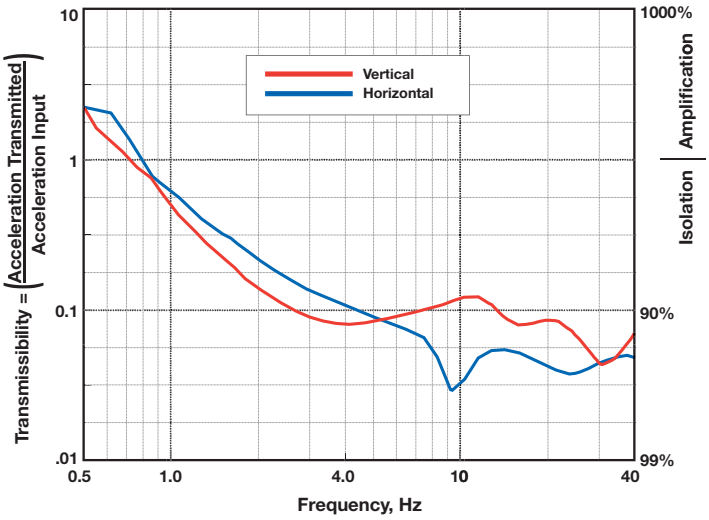
SEM-Base is a compact, cost-effective alternative to our 65 Series STACIS® 2100 Floor Platform (page 7). It incorporates STACIS technology but has a much smaller footprint and installs easily with minimal tuning. Simply put the SEM on the platform, power up, and you're done.

With vibration cancellation starting below 1 Hz, SEM-Base features extended stroke piezoelectric actuators and damped, powder-coated steel plates that sandwich four isolators and TMC's DC 2000 digital controller. The system is only 5.5" tall, measures 35.5" x 44.5", weighs less than 400 pounds, and can support 900 to 2,500 pounds with no soft air suspension.

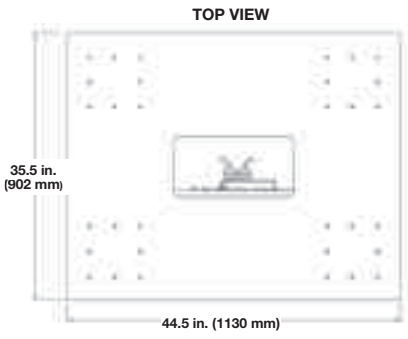
Features

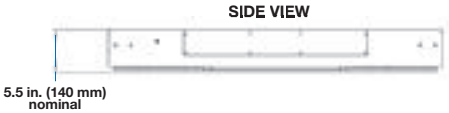
- Incorporates patented STACIS® technology
- Active inertial vibration cancellation system
- 35.5 x 44.5 x 5.5 inches, fits most commercial SEMs
- Load capacity: 900 - 2,500 lb.
- Vibration cancellation starts below 1 Hz
- Extended stroke piezoelectric actuators, up to 60 microns
- 6 active degrees-of-freedom
- Installs easily, minimal tuning required
- Compatible with all internal tool vibration isolation systems
- No soft air suspension
- Simple, robust, and cost-effective
- Optional casters allow easy portability, no lifting required
- Ask about our SEM-Lift™ System for installation

Transmissibility*



* 2,150 lb. (980 kg) payload with simulated floor vibration at VC-E (125 micro-inches per second, 3 microns per second)



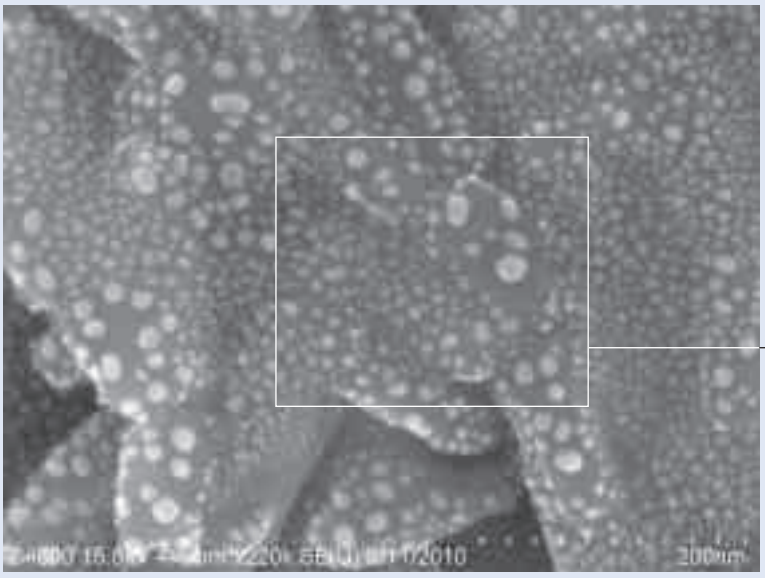


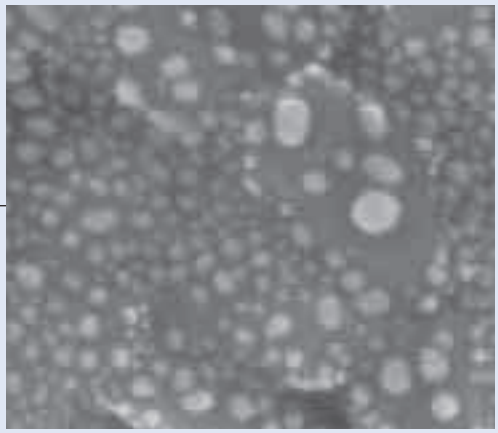
APPLICATION NOTE

Before and After Images, Hitachi S-4800 on STACIS® iX SEM-Base™ (actual customer supplied data)

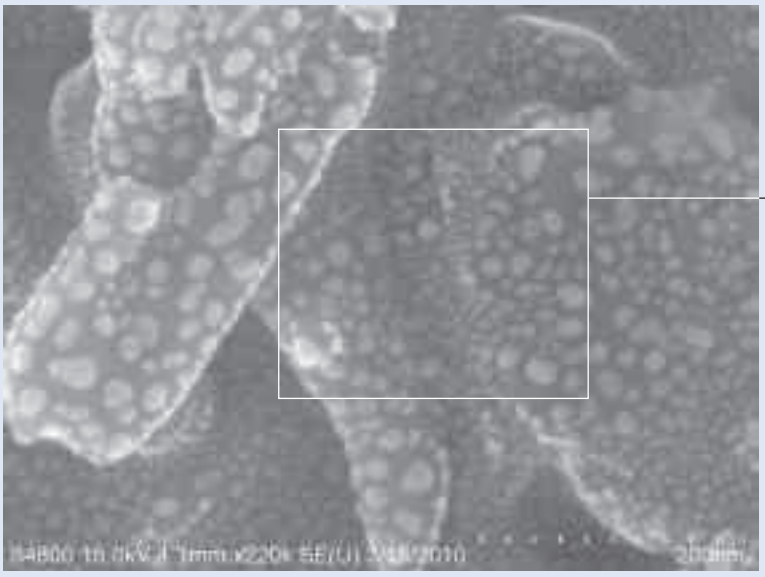
Shown below are "before and after" images obtained by an Hitachi S-4800 Scanning Electron Microscope isolated on a TMC STACIS® iX SEM-Base™ at Nationwide Children's Hospital in Columbus, Ohio. Images of a pure gold reference sample were taken at 200,000x magnification. In spite of the severe vibration environment (6th floor on a windy day), the SEM-Base™ yielded resolution within specification. These two images were taken immediately before and after the SEM-Base™ installation, respectively. No other variables were changed between photographs.

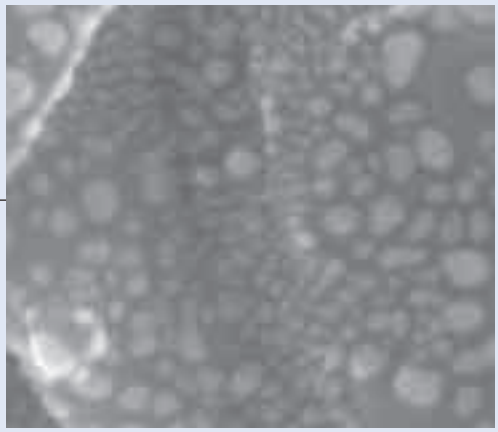
Before





After

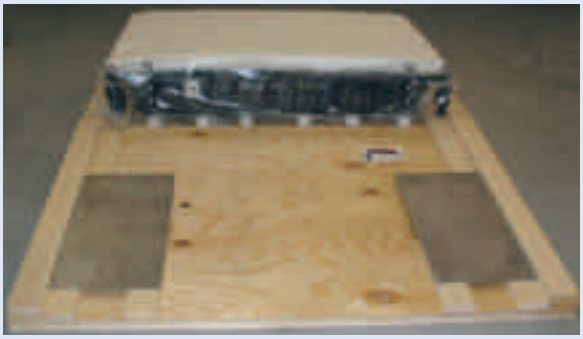




Ask about helpful options that will ensure a smooth SEM-Base™ installation.

SEM-Lift™

Convertible Roll-Off Crate



SEM-Base™ (shown with optional retractable casters) may be provided with a convertible roll-off crate. The crate cover converts to a sturdy ramp and the cover slats form a guide for the wheels.

SEM-Lift™ is a safe and sturdy lifting device for scanning electron microscope (SEM) columns. It simplifies and speeds SEM-Base™ installation on a previously installed SEM column. SEM-Lift raises the column several inches allowing SEM-Base™ to be rolled into place.

STACIS® iX SEM-Base™ Floor Platform isolating an FEI Helios NanoLab DualBeam SEM/FIB (top left), a JEOL JSM-6700F Field Emission Scanning Electron Microscope (top right), an Hitachi S-3400N SEM (bottom left), and a Zeiss UltraPlus Field Emission Scanning Electron Microscope (bottom right).