



TetraTek Products, Inc.
We Put It All Together

TetraTek VibraTek™ Test Fixtures

HALT and HAST
Vibration Test Accessories

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VibraTek™ Test Fixtures

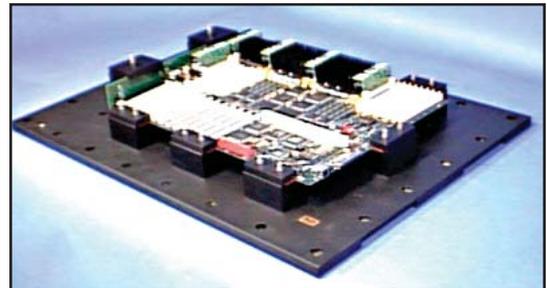
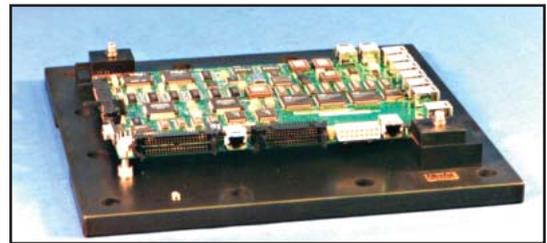
Proven HALT and HAST Technology

VibraTek™ offers both standard and fully custom, precision machined, magnesium, and aluminum vibration fixtures with stainless steel and aluminum hardware. These fixtures incorporate special clamps, retainers, connectors, circuit boards, and cable sets to provide you with the ideal testing arrangement for your products while they are tested for HALT (Highly Accelerated Life Testing) and HAST (Highly Accelerated Stress Screening).

Our Highly Accelerated Life Testing (HALT) fixtures are rated to withstand 100 Grms vibration levels and temperature change rates of up to 100 C per minute over a temperature range of up to -65 to 150 C. HALT testing progressively stresses your product using both vibration and temperature cycling until you understand the limits and characteristic modes of thermal and vibration failure. After you have modified your product to eliminate the obvious modes of failure, HAST testing helps you to eliminate marginal products likely to fail early while passing the acceptable units with as little degradation in life as possible.

We make products to conveniently and reliably hold prototype products in place while you perform HALT testing and we make fast loading, and easily used production rated fixtures and handling equipment for HAST testing. Typically these systems are used for testing electronic equipment. To provide a complete service to our customers, we also offer custom product connectors, vibration rated card cages, associated passive and dynamic electronic exercise and load boards, data acquisition systems, and monitoring instrumentation packages.

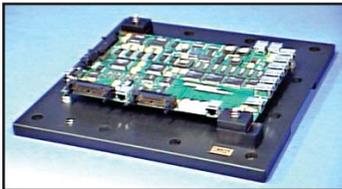
We invite you to request a free analysis of your needs.





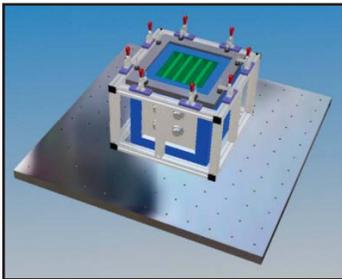
VibraTek™ Test Fixtures

Optimized HAST Production Fixtures



Our Highly Accelerated Stress Testing production fixtures are optimized to withstand the extreme environments typical in Stress Screening Environmental Chambers while efficiently transferring vibration to your test objects.

Baseplates are manufactured from machined magnesium or anodized aluminum. Baseplates made from non-metallics such as G-10 (circuit board material) and acrylic composite are also available. All baseplates include integral lifting grooves, slots, or attached black anodized aluminum lifting handles.



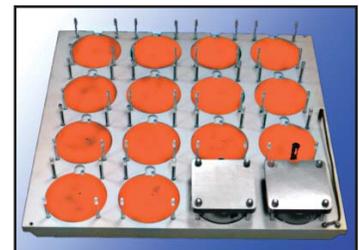
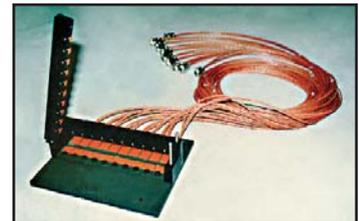
Product support structures are fabricated from contour matched black anodized aluminum.

Also available are product fixtures made from VibraTek™ vibration rated flexible construction 1-1/2" x 1-1/2" and 1-1/2" x 3" reinforced clear anodized aluminum extrusions. These structures are typically used for large box enclosed test items.

Vibration coupling is achieved with precision cut silicone gaskets retained in matched contoured cavities. Products are held in place by vibration rated stainless steel quick release clamps, VibraTek™ slide action clamps, VibraTek™ SuperClamp™ Screw Piers and product specific milled compression caps with quick release knurled fasteners or clamps. All hardware is normally 300 series stainless steel.

You can specify features such as positioning pins, lifting eyes, test item cable sets, anti-static grounding jacks, board first mate pins, vibration rated electrical connectors and roll-around carrier adapters.

We can also furnish you with complete production testing solutions including multiple matched or interrelated test fixtures, environmentally rated Stress Screening Chamber fixture loading lifts, chamber thermal diaphragms, roll-around fixture carriers, product pretest stations to verify proper operation prior to testing, data acquisition equipment to monitor your testing, and passive and dynamic loads to stress and verify your products under load.





VibraTek™ Test Fixtures

Flexible Clamping Techniques



Our VibraTek™ VSC SuperClamp™ Series III is a matched set of interchangeable HALT and HAST capable circuit board retaining clamps designed to conveniently hold almost any circuit board in place.



Products in this Series include:

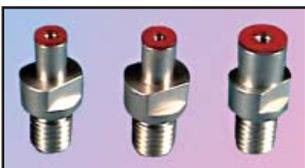
- ❖ VSC100-III Long Tail 4-40, 6-32 and 8-32 Screw Pier.
- ❖ VSC105-III Short Tail 4-40, 6-32 and 8-32 Screw Pier.
- ❖ VSC150-III T-Nose Long Tail Flexible Toggle Clamp.
- ❖ VSC300-III Long Tail Dual Flat Toggle Clamp
- ❖ VSC305-III Short Tail Dual Flat Toggle Clamp
- ❖ VSC400-III Sliding Toggle Clamp
- ❖ VSC500-III Dual Vertical Board Support Clamp

Our SuperClamps™ are designed to mount on the surface of your shaker utilizing the shaker's standard 3/8"-16 mounting holes. By carefully selecting the correct clamp and aligning your product appropriately, almost any circuit board can be successfully tested utilizing its built-in mounting holes and edges.

Typically, VSC100 and VSC105 SuperClamps™ are used for picking up interior mounting holes, one or more VSC300's or VSC305's are used to simulate a card cage edge, one or more VSC150's are used to hold small trace-free circuit board edges, VSC400's are used like VSC150's to fit into tight places in the overall layout and two or more VSC500's are used to support any larger vertical daughter boards. These clamps are rated for a maximum of 100 Grms and a temperature range of -65 to 150 C.

You can request copies of our individual bulletins on these clamps for additional details and mounting dimensions. We provide a free analysis of the best clamp mix for any particular product mounting problem. Please provide us with information on your shaker and an outline drawing of your product.

We also offer 4-40, 6-32, 8-32, 10-32 and Metric stainless steel mounting piers, side mount pier supports, mounted toggle clamps with custom clamping heads, vertical board cantilever slide support clamps, horizontal board cantilever edge support clamps, and custom clamps optimized to match your product or vibration machine.





VibraTek™ Test Fixtures

Convenient Loading and Handling

Our VibraTek™ VCL75 Series Chamber Fixture Lifts are designed to conveniently lift and lower our vibration fixtures onto the surface of your shaker and onto our VHC75 Series Fixture Carriers. The VCL75's and the VHC75's conveniently work with major Environmental Test Equipment manufacturer's AGREE and Stress Screening Chambers. These chambers typically have a space below the shaker with a silicone diaphragm separating the chamber workspace from the shaker area. Adaptors and custom fitted silicone diaphragms are offered for most chamber sizes and models.



Our standard VCL75 Fixture Lifts include:

- ❖ Roller bearing slide-in and slide-out fixture support.
- ❖ Hydraulic cylinders on each corner.
- ❖ An electric hydraulic pump.
- ❖ Antistatic banana jack type plugs for grounding.
- ❖ Power return springs.
- ❖ A black anodized aluminum structure.
- ❖ Electrical lift interlocks.
- ❖ Optional thermal protection for lift components.



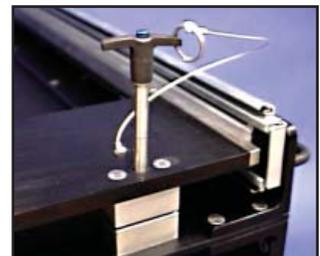
Our standard VHC75 Fixture Carriers include:

- ❖ Roller bearing slide-in and slide-out fixture support.
- ❖ Hydraulic or lead screw lifts on each corner.
- ❖ An manual-hydraulic pump or a manual lift crank
- ❖ Anti-static plugs for grounding your fixturing.
- ❖ Conductive cushion guide wheels.
- ❖ Wheel locks and brakes
- ❖ T-handle pins to retain fixtures when moving.
- ❖ A black anodized aluminum structure.
- ❖ Compound drawer type fixture extension.
- ❖ Optional dual load per cart capability.



Custom Fixture Carriers and Fixture Lifts are available.

Our VCB35 series Vacuum Base Plates bolt-down over the surface of your shaker and allow quick attachment and removal of test fixtures and our VVP35 series Vacuum Pumping Stations provide the controls to conveniently operate the Base Plate.



VCB35 Vacuum Base Plates typically allow fixture operation from about 10 Grms up to approximately 55 Grms depending on shaker load mass and head size. VVP35 Vacuum Pumping Stations can optionally include oil-less vacuum pumps, acoustic enclosures, interlocks to chamber and vibration controls and vibration sensing electronics.



Information and Quotations from TetraTek:

For additional information, you may wish to review our Industrial Equipment web site <http://www.tetratekproducts.com>.

We are happy to share our expertise with you. Quotations are prepared promptly based upon your specific needs. We also supply budget information for future planning purposes. If you need advice on a current or upcoming project, please contact us. In most cases, there is no charge.