

UHS Halt & Hass Chambers

Why accelerated testing?



UHS1400



UHS300

Accelerated testing is used to quickly detect any inherent design and manufacturing flaws. The environments are meant to give high levels of stress to precipitate failures in less time than in standard testing. Once the failures have been detected, corrective decisions can be made. This process adds to product robustness. The main element of the testing process is the HALT test. Typically, a series of individual and combined stresses such as multi-axis vibration, rapid temperature cycling and product power cycling are applied in steps of increasing intensity (well beyond those expected in the field). Test time is compressed with the accelerated stressing, leading to earlier product maturity.

WHAT IS HALT?

HALT - Highly Accelerated Life Testing

This is the process by which a product is tested, usually in its design or prototype stage, using temperature, vibration, and the combination of environments to test until the point of failure, typically using step stress methods. If the failure is unexpected, or below the limits deemed acceptable for its useful lifetime, then corrective action is taken and the testing continued.

WHAT CAN HALT DO?

The Accelerated Life Test can show you, often in just a matter of hours, how a particular product will stand up to years of operational life.

HOW?

By using the ACS UHS System you can submit your product to extremes of environmental stress. You can perform various accelerated stress tests like HALT, HASS, Step Stress Testing and others. Each type of stress identifies specific defects that may be missed by traditional testing methods and equipment.

WHY?

When these defects are speedily identified in the product development stage, it helps to reduce development time and produces higher quality product. Shorter development time means shorter time to market, something that can make a huge difference in sales. Higher reliability during the operational life-span reduces warranty costs and general in-the-field repair costs. It also brings about customer satisfaction, something that is invaluable in a tough economic climate.

UHS - Ultra High Stress chambers

ACS UHS chambers are designed specifically to perform accelerated tests by applying extreme environmental stress. These stresses include:

- Tri-axial vibration imparting 6 Degree of Freedom vibration to the product
- Rapid thermal cycling
- Optional Humidity

In order to accomplish this, the chambers have the following features:

- 3 accelerometers for measurement, one for each of the X, Y and Z axes
- The ability to dwell for as long as necessary at a given temperatures.
- WinKratos software to allow the user to interface with the chamber for programming of environmental test cycles and control events, and for real-time acquisition and recording of data
- An optional humidity control system to give an added environment

The UHS 1400 also has:

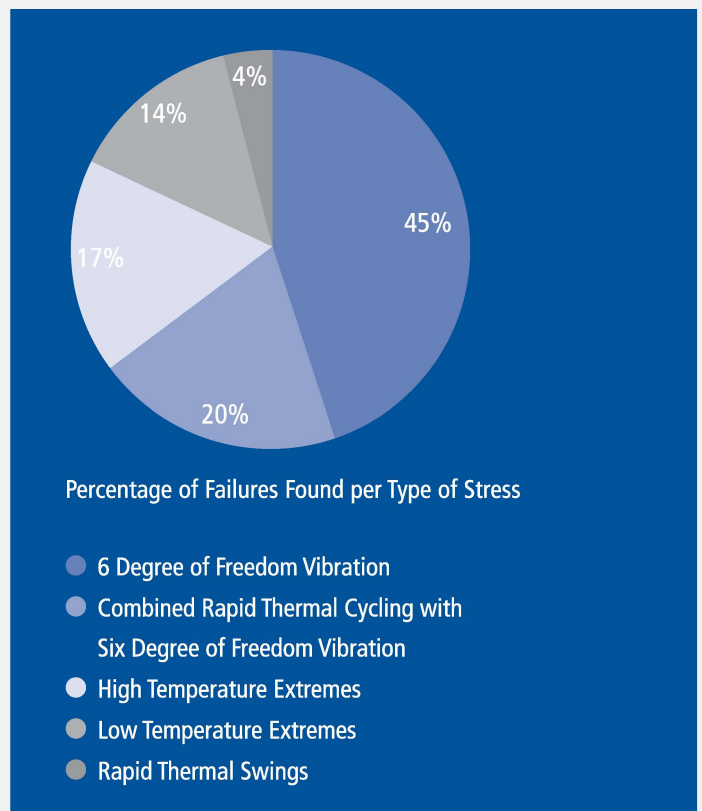
- Two full opening doors (front and rear) for ease of product loading and fixturing
- Adjustable table height giving the flexibility to be able to test larger products

Some of the many benefits of accelerated testing

- Fast design and process maturation
- Greatly reduced manufacturing screening costs
- Faster corrective action for design problems
- Reduced total engineering costs
- Reduced production costs
- Earlier and mature product introduction
- Higher MTBF
- Reduced warranty costs
- Happy customers

Goal: reliability

Reliability is a key factor for product durability and for competitiveness in the global marketplace. Both the user and the manufacturer gain from higher reliability. The user has a product that does what it is supposed to when it is supposed to without failure. The manufacturer has lowered production costs and fewer product returns. Everyone wins. At Angelantoni Test Technologies, we have combined more than 80 years of experience in the design and manufacture of environmental test chambers to provide a state-of-the-art system capable of providing the user with the best performance in the reliability growth process.



Focus on features



Rapid thermal cycling

The UHS temperature range is from -100° to $+200^{\circ}\text{C}$. The systems use liquid nitrogen for cooling and nichrome heaters for heating. The temperature change rate is up to $100^{\circ}\text{C}/\text{minute}$. The air flow is $20\text{m}/\text{sec}$, giving your product a thorough conditioning.

Each UHS system has the option of being able to add humidity. The capacitance sensor has its own port, and during humidity tests is positioned near the ceiling.

Tri-axial vibration system

Each UHS system comes complete with a tri-axial repetitive shock vibration system that allows the product to see 6 Degree of Freedom movement. There is vibration in the X, Y, Z and three rotational axes. Pneumatic vibrators are mounted beneath the table to provide the excitation.

Accelerometers are included for the X, Y and Z axes; the accelerometer tri-axial mounting block can be placed on table top (Temperature range $-100^{\circ}\text{C} \dots +121^{\circ}\text{C}$)

Vibration table performances (all performances are guaranteed at $20 \dots 30^{\circ}\text{C}$ without any load):

- 1 Six-Degree-of-Freedom (6DoF) Vibration, non-coherent broadband vibration 5-10,000Hz
- 2 Acceleration up to 80 gRMS measured on table top on Z axis
- 3 Ceramic-Coated Vibration Table with 90% of vibration energy in 5-4000Hz for maximum energy in low frequency range.

Vibration table load capacity: 315kg

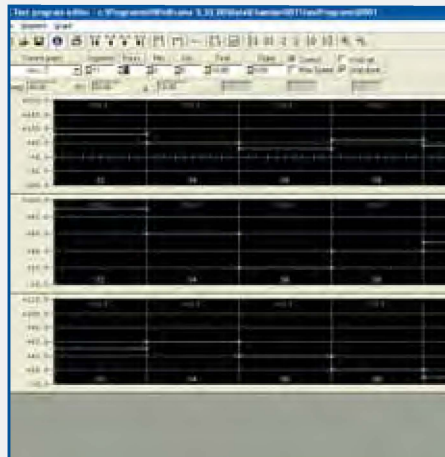
Winkratos software

Each UHS chamber comes with a dedicated software for running the tests. This allows temperature and vibration control along with simultaneous data acquisition. (It also controls optional humidity.)

Double full opening doors

On each side of the UHS 1400 there are single doors opening to more than 180° for easy loading, unloading and fixturing of the product(s) to be tested.

This also allows a forklift to have easy access for changing the table from one position to the other in the chamber.



General Equipment Specification ^L

Temperature Range
 Temperature Change Rate

 Vibration table size
 Acceleration
 Frequency Range
 Pneumatic Vibrators
 Internal Dimensions
 External Dimensions (W x D x H)
 Heating:
 Cooling:
 Humidity (optional):
 Noise level:

UHS 300

-100° to +200° C
 up to 100°C/min on air over the range
 -60°C/+150°C and viceversa
 24" x 24"
 Up to 80 gRMS
 5 to 10,000 Hz
 4
 760 x 760 x 500 mm
 1550 x 1150 x 2050 mm
 40 kW by nichrome heaters
 Liquid nitrogen expansion
 20% to 90% from 30° to 85° C
 74÷76 db (A) at one meter with door closed

UHS 1400

-100° to +200° C
 up to 100°C/min on air over the range
 -60°C/+150°C and viceversa
 36" x 36"
 Up to 80 gRMS
 5 to 10,000 Hz
 9
 1150 x 1150 x 1030 mm
 2200 x 1580 x 2670 mm
 120 kW by nichrome heaters
 Liquid nitrogen expansion
 20% to 90% from 30° to 85° C
 78÷80 db (A) at one meter with doors closed

Other sizes available upon request

Air Pressure for Vibration:
 (Clean and dry air)
 Air Flow for Vibration:
 Liquid Nitrogen Pressure:
 Voltage*:
 Amperage:

UHS 300

9 bar to reach 80gRMS,
 about 6 bar to reach 60gRMS
 100 Nm³/h
 6-8 bar
 400 V ±10% 50 Hz 3 + N + G
 Max. 80 A

UHS 1400

9 bar to reach 80gRMS,
 about 6 bar to reach 60gRMS
 210 Nm³/h
 6-8 bar
 400 V ±10% 50 Hz 3 + N + G
 Max. 205 A

*60 Hz upon request

Education and Training

No matter how good a piece of equipment is, if the user doesn't understand both it and the testing principals involved it will not be truly effective. When you purchase an ACS UHS chamber, you are not just getting a piece of equipment but also intensive training by a world renowned HALT expert with almost two decades of experience in the industry. The educational process may include the following:

- Seminars
- Consulting during the order process
- Site visit to discuss set up and facilities need and to give product specific advice
- Testing training during chamber pre-acceptance testing at ACS
- Training of all related personnel on site after chamber set up and connection to facilities



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