

Because People Rely on Your Products,  
Everyday, You can Rely on Us



# TESTING SERVICES

Environmental Testing | Shock & Vibration Testing



# CSZ TESTING SERVICES



No matter what industry you are in, it is important to provide safe & reliable products your customers can count on. Whether as a method to ensure product reliability, safety and durability, or as a proactive measure to stay ahead of the competition, testing can save time and money.

By testing your products in simulated environments you can:

- Reduce Product Development Time
- Increase Customer Confidence
- Ensure Product Quality & Reliability
- Forecast Life Expectancy
- Reduce Costs / Increase Profitability
- Reduce After Sales Service

## Your Laboratory Testing Partner

**CSZ Testing Services is an experienced test facility with dependability you can rely on**

Companies in a diverse group of industries rely on CSZ Testing Services and our team of experienced test personnel to deliver high-quality environmental, climatic, shock, and vibration testing services—fast.

Since 1988, we have provided cost-effective solutions in order to meet customers product development needs.

Our test laboratories serve a number of industries with varying needs. Tests are customized to each need, but some common test applications include:

- |                                     |  |
|-------------------------------------|--|
| ▪ Aerospace Components              | ▪ Mil-Std Testing                          |
| ▪ Automotive Components             | ▪ Packaging                                |
| ▪ Batteries                         | ▪ Plastics                                 |
| ▪ Chemicals                         | ▪ Solar Cells/Panels                       |
| ▪ Electronic Components and Devices | ▪ Telecommunication Components and Devices |
| ▪ Medical Devices                   |  |

## Why Test Your Product at CSZ?

- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| ▪ Full compliance with ISO/IEC 17025 | ▪ Professional and experienced staff |
| ▪ Detailed test reports              | ▪ Latest equipment and technology    |
| ▪ Quick turnaround and response      | ▪ Custom-designed fixtures and tests |

All testing services and results obtained at both the Ohio and Michigan laboratories are A2LA accredited and are compliant with ISO/IEC 17025.

## Testing Service Offerings

With a wide variety of chambers, shakers and state-of-the-art equipment on hand, We are capable of simulating any environment. Our experienced test personnel will quickly determine the most efficient test procedure set-up to accommodate products of different sizes for fast turnaround of your project. CSZ's test technicians routinely customize testing services to meet unique requirements. Both fixturing and test setups can be custom-tailored.



## Data Analysis

Upon completion of testing, we will provide you with a comprehensive data analysis detailing the total product assessment under test conditions. Meticulous, documented reports of your test results are backed by our test certificate and accreditation. Data monitoring and reporting methodologies are available up to 500 channels.

## Durability & Robotic Testing

For durability testing, CSZ can devise customized robotics for acceleration/de-acceleration of assemblies in conjunction with environmental factors, such as temperature and humidity.



## TESTING CAPABILITIES

### ENVIRONMENTAL

- High and Low Temperature
- Temperature/Humidity
- Combined Temperature/Humidity/Vibration
- Thermal Shock
- Burn-in
- Altitude/Temperature/Humidity
- Salt Spray/Cyclic Corrosion
- Accelerated Aging
- Stability

### HALT/HASS

- Rapid Thermal Cycling
- Multi-Axis Vibration

### DYNAMIC VIBRATION

- Random, Sinusoidal, Mixed Mode
- Transportation and Packaging
- Gunfire
- NAVMAT Screening
- Combined Vibration/Temperature/Humidity
- Drop Testing

### SHOCK

- Half Sine
- Sawtooth
- Squarewave
- Pyrotechnic
- SRS
- Analog Capture

### RADIATOR TESTING

- Temperature Cycling
- Fluid Pressure
- Vibration Testing
- SAE J1542



# Testing Capabilities

Our testing laboratory is fully equipped to perform basic temperature cycling tests to accelerated testing. Long term temperature and/or temperature/humidity testing is available for packaging storage test, life testing, etc.

## Temperature & Humidity Testing Services

We provide a full range of environmental chambers for temperature cycling testing and/or temperature & humidity testing. Whether you need to perform accelerated stress testing to find product flaws or store your product under temperature /humidity conditions for long term accelerated aging testing, we have the in-house capabilities you require.

Climatic testing and environmental testing capabilities include the following:

- High and Low Temperature
- Temperature / Humidity

Capabilities/Limits	
Temperature Range	-73°C to +190°C
Humidity	10% to 98% RH
Chamber Size	Up to 1600 cu. ft.
Temperature Transition Rate	Up to 15 °C per minute



## Corrosion Testing & Salt Spray Testing Services

Corrosion testing simulates the effects on your product from salt and sea mist. Tests are designed to evaluate corrosion properties and resistance to corrosion of your product. It is often performed on coatings, paints, automotive components, electronic connections and virtually any product that may be corroded from being exposed to salt and/or sea mists. CSZ corrosion tests conform to a variety of ASTM, automotive and commercial test specifications. These tests may also be adapted to your specific needs.

Capabilities/Limits	
Temperature Range	Ambient to 71°C
Humidity	95% to 100% during high humidity
Chamber Size	Up to 31 cu. ft.

CSZ Test Laboratory offers a variety of shock and vibration testing services for testing a wide range of products across many industries.



## Vibration Testing & Shock Testing Services

We offer a variety of shock and vibration testing services for testing a wide range of products across many industries. Shock and vibration testing is monitored via digital vibration and control analysis equipment tailored to match your specific hardware.

- Random, Sinusoidal, Mixed Mode
- Transportation and Packaging
- Gunfire
- NAVMAT Screening
- Vibration Combined with Temperature and/or Humidity

Capabilities/Limits	
Force Output	13,500 lbf/sine, random, 3-axis vibration
Displacement	3.0 inch peak-peak
Velocity	78.0 inches/second
Acceleration	100 g's Sine, 60 g's Random
Frequency Range	5-3000 hz
Table Size	Up to 48"



## Shock Testing Services

- Half Sine
- Sawtooth
- Squarewave
- Pyrotechnic
- SRS
- Analog Capture

## Mechanical Shock Testing Services

We offer lightweight mechanical shock testing services for products weighing less than 200 lbs. Our lightweight shock machine is a pneumatically-controlled machine which can conduct mechanical shock testing using half-sine, sawtooth, and square-wave pulse to meet verification and validation protocols.

Our services meet common test requirements for MIL-STD 202 method 213, MIL-STD-810 method 516.6, MIL-STD-750-2 method 2016.2, as well as many other military and industrial standards.

Capabilities/Limits	
Shock Response Spectra (SRS)	half-sine, sawtooth, square-wave pulse
Cycles per min	up to 8
Carriage & Mounting	16" x 16" table
Maximum Stroke	17"
Terminal Velocity	400"/sec (285"/sec @ 150 lbs.)
Programmable Conditions	10
Drop Cycles	up to 100



# Testing Capabilities

## Thermal Shock Testing Services

Thermal shock testing is designed to thermally shock and stress a product as a result of rapid temperature changes from extreme cold to hot environments. This detects latent product flaws by stimulating defects at the lowest level of assembly, before they reach your customer. Thermal Shock testing is designed for testing electrical, automotive, and military components.

Capabilities/Limits	
Temperature Range	Hot Chamber: 71°C to 210°C (160°F to 410°F) Cold Chamber: -75°C to 190°C (-103°F to 375°F)
Chamber Size	Up to 144 cu. ft.

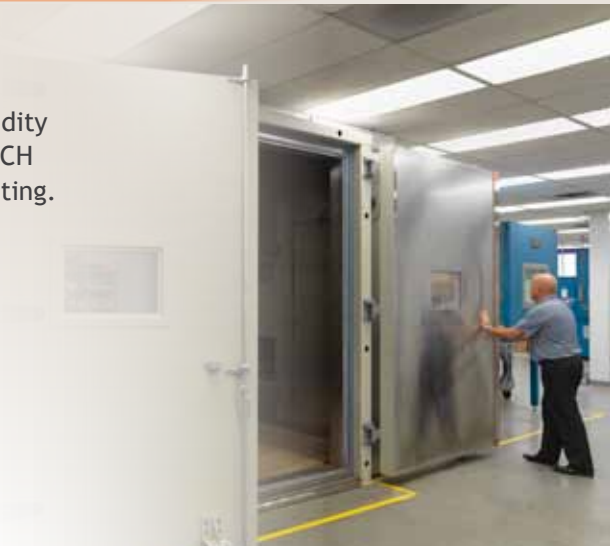


## Stability Testing & Accelerated Aging

We offer stability testing, accelerated aging, shelf life testing, and package testing services. We offer a full range of temperature & humidity chambers that meet various test specifications including ASTM, ISTA, ICH Q1A and other test standards that involve temperature & humidity testing.

### Long Term, Immediate and Accelerated Storage Conditions

Capabilities/Limits	
Temperature Range	-4°C, -20°C to +60°C
Humidity Range	10% to 95%
Environmental Chambers operate in accordance to ICH climatic zones	<ul style="list-style-type: none"> <li>• +5°C</li> <li>• -20°C</li> <li>• 25°C/40%RH</li> <li>• 25°C/60%RH</li> <li>• 30°C/35%RH</li> <li>• 30°C/65%RH</li> <li>• 40°C/75%RH</li> </ul>



## Altitude Testing Services

Altitude testing combines temperature with altitude and optional humidity to test components or subassemblies. Altitude testing is available from -1,500 to 100,000 ft (8.2 Torr).

Testing may be performed to Mil Std-810 to determine if material can withstand and/or operate in a low-pressure environment or rapid pressure changes. We also offer special tests required by the RTCA DO-160 test specification for testing for aircraft avionics.

Capabilities/Limits	
Altitude Range	100,000 ft. (8.2 Torr) Standard
Temperature Range	-65°C to +190°C
Humidity	10% to 95% RH
Chamber Size	Up to 32 cu. ft.





CSZ's HALT & HASS Time Compressor® chambers incorporate the highest level of technology and quality for the optimum in reliability testing.

## HALT Testing Services

Our laboratory provides HALT (Highly Accelerated Life Testing) & HASS (Highly Accelerated Stress Testing) testing services to help shorten new product development time, decrease warranty costs and significantly improve product reliability. CSZ's HALT & HASS chambers incorporate extreme temperature change rates & random, multi-axis vibration with 6 degrees of freedom to rapidly uncover design and/or process weaknesses.

Capabilities/Limits	
Temperature Range	-100° C to 200° C
Temperature Ramp Rates	> 90° C per minute
Vibration Levels	1 - 90 GRMS
Frequency Range	0 Hz - 10 KHz control
Table Size (cm)	30" x 30" (76cm x 76cm)
Workspace Dimensions	34" W x 34" D x 34" H (86 cm x 86 cm x 86 cm)



## Drop Testing Services

Our test lab utilizes the latest drop testing technology to simulate conditions which may occur to packages and products during handling or during the transportation and shipping. These test methods are designed to evaluate the integrity of packages or products and their design limits for protection from collisions or drops which are likely to occur in the distribution or end-use environment.

Common drop test conditions consist of a freefall from various heights onto a solid surface. The drop height for each test is dependent on requirements set forth by standards such as those from ASTM or ISTA.

Capabilities/Limits	
Maximum Package Weight	661 lbs
Maximum Package Size (front to back)	41.5 in
Drop Height Range	1-72 in



## Radiator Testing

We provide a variety of different testing services for radiator testing. Some of these types of tests include temperature cycling which is performed by pumping hot and cool fluid through the radiator. Fluid may also be cycled through the radiators at various pressures. Vibration testing is often utilized to help detect weaknesses in the product such as cracking and defective welding joints.

Our radiator testing services meet SAE J1542 other customer requested tests.

CSZ Testing Services' laboratories are equipped with state-of-the-art technologies for comprehensive, independent testing of products in the aerospace, automotive, chemical, defense, electronics, medical, plastics, power generation, and telecommunications fields.

As well as offering testing services, CSZ also manufactures a wide range of environmental test chambers from benchtop to full walk-in rooms. As a manufacturer and accredited testing services company, you can rely on a single organization to meet your testing and test equipment needs.

Interested in performing your own testing in-house?  
Visit [www.cszindustrial.com](http://www.cszindustrial.com) for more information.

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