

Reliability Testing Services



What Is Reliability Testing?

Reliability can be defined as the ability of a product to meet its design criteria over an extended period of time. Reliability testing is based around defining the hazards a product will be subjected to in the manufacturing, shipping, installation and end-use environments. Every product will be exposed to a unique set of environmental hazards. Fortunately, comprehensive industry standards exist defining the most common environmental hazards for most product types and use classifications.

Why Is Reliability Testing Important?

Basic reliability tests are required for safety and certification purposes. By identifying and correcting failures resulting from environmental stress testing performed during the development cycle, long-term customer satisfaction can be increased and warranty costs reduced. Products proven to be robust and reliable through comprehensive testing will increase stakeholder confidence and offer a long-term competitive market advantage.

When failure modes are identified and documented during testing, the results can be used by design engineers to improve the product's ability to withstand the hazard. Testing can also be conducted to replicate issues discovered in the field, allowing potential design alternatives to be evaluated quickly and reliably. Lastly, testing is often performed to compare alternative or cost-optimized designs and materials to ensure the product is adequately robust.

How Is Reliability Tested?

Products are subjected to simulated hazards they are anticipated to encounter during their lifecycle using controlled and repeatable test methods and equipment, often to an industry standard. Tests are usually conducted separately (temperature, shock, vibration, etc.) to reduce test costs. However, tests can be combined to simulate environmental conditions that replicate failure modes which would not otherwise be produced with single hazard testing.

Note from Aaron Suarez, Director of Engineering

"Westpak's testing resources are top-notch and of the highest quality."



Reliability Tests

- Temperature / Humidity
- Altitude / Pressure
- Vibration
- HALT/HASS
- Mechanical Shock
- Freefall Drop / Impact
- Solvent Testing
- Ultraviolet (UV) Light
- Salt Fog
- Ingress Protection
- Mechanical Characterization
- Mechanical Cycling

Westpak's ISO 17025 accreditation assures you of the highest quality testing and data provided by any testing laboratory.

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Temperature and Humidity Testing

Subjecting the product to hot and cold temperature extremes stresses a product's ability to withstand conditions which may be encountered during shipment and end use. Exposure to humidity stresses corrosion-prone components and sealed enclosures.

Altitude and Pressure Testing

Low pressure / high altitude environments can cause sealed volumes to expand or rupture and also reduce the product's ability to convectively cool itself. High pressure testing is often performed on units expected to see a pressure hazard in their environment, such as under-water submersion.

Vibration Testing

Vibration stresses are greatest when product resonances are excited. Resonance can be achieved by using either sinusoidal or random vibration. High amplitudes during testing are often used to increase the stress level, reduce test time, or both.

Mechanical Shock Testing

Half-sine, terminal peak saw tooth, and trapezoidal shock pulses can be used to quantify product robustness and identify weak areas or components. Shock testing can be used to verify product robustness for high stress environments.

Freefall Drop and Mechanical Impact Testing

Small products are often accidentally dropped by users. Precisely controlled drop testing in the laboratory will identify product design deficiencies, potential damage modes and any safety-related issues caused by dropping the product.

HALT/HASS Testing

Highly Accelerated Life Testing (HALT) is a specialized reliability test during which the product is exposed to environmental stresses to the point of failure. Highly Accelerated Stress Screening (HASS) can help identify weak or compromised samples even faster than using burn-in techniques.

UV Testing

Paints, coatings, polymeric and organic materials are prone to yellowing, fading, cracking and other damage caused by UV light exposure from natural sunlight. Laboratory testing can help determine a material or product's ability to withstand weathering in the outdoor environment.

Salt Fog Testing

Products are often exposed to marine or other corrosive atmospheric environments. Salt fog testing provides corrosion resistance results quickly and inexpensively for materials and products.

Ingress Protection Testing

Ingress Protection (IP) testing includes determining resistance to water spray and submersion as well as mechanical ingress including large object, finger and dust.

Mechanical Characterization and Cycling

Testing is conducted to determine the mechanical force required for the insertion or removal of interfacing parts, activation force of buttons, and other mechanical movements. Mechanical cycling is performed on components expected to see repetitive movement during their service life. Subjecting assemblies to millions of cycles using custom test fixtures and load frames is not uncommon.

Testing Standards Include:

ASTM B117
ASTM G154
ASTM D3332
ASTM D3580
ASTM D6653
IEC 60068-2
MIL STD 202, 810, 883
Telcordia GR-63



For more information or a quote, please contact one of our offices below or go to: www.westpak.com/contactus.aspx

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