How can production line testing safeguard reliability and lifetime performance of electronics components?

Answer: Rigorous testing of electronics’ sealed enclosures to IP67 standard is streamlined with superior mass flow leak test instruments.

The Challenge

- Smart Phones
- Medical Wearables & disposables
- Cameras for AV applications
- Radar/Lidar Enclosures
- And more…

These and similar electronics-based products can only be reliable if and when they are able to withstand dirt and water.

Specifically, these electronics-based components must all meet or exceed IP67 ingress ratings. That means they must be totally protected against dust and protected against the ingress of water in a harmful quantity after immersion in 1 meter of water for up to 30 minutes.

Without proper IP 67 testing of sealed enclosure integrity, the lifespan and performance of a fast growing array of consumer and industrial electronics components cannot be assured.

The InterTech Solution

As a first step, InterTech will determine the required test specification based on sample evaluation of the device under test. The goal is a cost effective test that has minimum impact on the production process.

An InterTech M1075 leak detector is used for fast and accurate testing to meet IP67 requirements. InterTech test technology automatically compensates for external changes such as temperature, and a unique test-centric design assures gage accuracy.

Mass flow leak testing with the InterTech M1075 is non-destructive, clean and easily handles specifications of 0.5 sccm at pressure of 0.2 to 0.3 bar with fast test times. Because it effectively checks for gross leaks prior to fine leak testing absolute reliability is ensured.

For example, a battery enclosure and valve are leak tested for IP 67 compliance at a rate of 120 parts per hour.

In another application, Electronic Control Modules are tested in a two-step process – first for gross leakage, followed by a fine leakage test to 0.6 sccm limit and 10% Gage R&R.

Test Process and Solution

Figure 1 shows the method used to test leakage in these sealed enclosures.

- The test part is placed in a chamber and the chamber and reservoir are pressurized to test pressure, and then isolated from the pressurizing source.
- If the test part leaks, the pressure inside the chamber will force air into the part. Since the reservoir remains at test pressure, air will flow from the reservoir into the chamber to maintain equilibrium. The mass flow transducer reading will be directly proportional to the leakage.

Benefits

- Superior mass flow transducers and integration of test circuits speeds accurate IP67 testing.
- The system’s rigid design makes it suitable for testing both vacuum and positive pressure conditions.
- Test system is integrated into quality control systems for traceability compliance with ISO 16949 & ISO 9001 requirements.

Additional Features

- Automated R&R mode facilitates scheduled machine qualification and audit traceability.
- A graph display of test cycle facilitates troubleshooting and cycle time optimization.
- Human error while calibrating is eliminated by using an InterTech CalMaster™ for calibration.