Background

Most current test methods for blister packages are destructive, time consuming, not sensitive, unreliable, and dependent on the properties of the package lidding material. Small semi-rigid, flexible, and multi-cavity blister packages do not have enough air inside the package to reliably detect defects by simple vacuum decay methods. Water submersion testing can also be used to test small packages, but it is destructive to both product and package, is highly subjective, unreliable and does not detect small defects. Also, it's impossible to use water submersion to inspect 100% of production. Neither of these inspection methods (vacuum decay or water submersion) will indicate which blister cavity is defective, and the reliability of the test results cannot be guaranteed. Non-contact sensor applications are capable of detecting the location of the defective blister cavity, but are also unreliable and may produce false measurements. Non-contact sensor methods also can be destructive, and laser deflection is very sensitive to the print and reflectivity of the package material.

VeriPac 225/BLV Technology: Unique Design by PTI

PTI's VeriPac 225/BLV is a 100% non-destructive inspection system for blister packaging featuring a new technology that combines the ASTM approved vacuum decay leak test method* with vision imaging technology to detect both large and small leaks and to identify the exact location of the defective blister cavity.

As already discussed, a blister cavity has little air inside the cavity, making large defects not detectable through the vacuum decay test method alone. Small defects can be successfully detected using vacuum testing, measuring the absolute and differential pressure. A flexible bladder is used to increase the sensitivity of the test as well as conform to the flexible portion of the package. To detect large defects, the vacuum decay test is combined with a vision sensor to detect the profile of the package. The shape of the bladder will allow the system to identify the location of defective blisters of both small and large leaks.

The test chamber is designed with an exposed flexible wall making contact with the flexible portion of the package, serving several purposes. As stated, the flexible chamber wall supports the package seal when vacuum is pulled, avoiding any plastic deformation and peeling of the seal area. The flexible chamber wall increases the sensitivity of the pressure measurements of the vacuum test. The flexible chamber wall is analyzed using the vision sensor, observing the displacement of space in defective blister cavities.

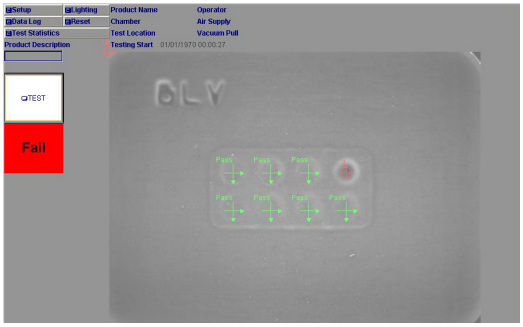
Compared to previous designs related to the same field of vacuum leak testing, this technology provides an entirely new method of leak detection. It is a non-destructive test that applies no stress to a blister seal. Unlike other methods that keep the blister cavity form after pressure has equalized, this method deflates blister cavities that are defective, providing very consistent displacement response of defective blister cavities. A vision sensor requires only one image to determine the package quality and location of defects, and due to the consistent profile difference between a defective and non-defective cavity, detecting defects from non-defects is very effective. The flexible wall covers the print and reflectivity of the package surface, making this an inspection solution for any blister package with flexible or semi-flexible seal/surface material.

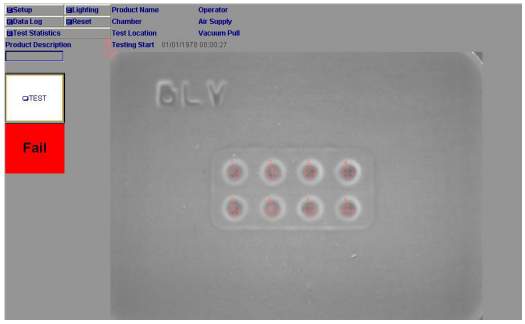
Functional Description of the VeriPac 225/BLV System

Product is placed in a test chamber, which sits on a drawer style mechanism that is closed during the test cycle. Once the chamber is closed, vacuum is pulled on the product, revealing pressure measurements that will allow detection of defective blister packages. Both the actual vacuum measurement and the differential vacuum measurement will determine whether the package is defective. This technology has several US Patents as well as Patents Pending.

The system produces several types of information including vacuum data, identification of defective blister cavities, and automatically stores data images of defects. The operator interface is a touch-screen PC that can be networked to a printer or database for data log collection.

Test result on the left indicates one defective blister cavity shown by the red mark. Test result on the right image shows all cavities defective.





Key Benefits of VeriPac

- Non destructive – non invasive
- No sample preparation
- Printed, non-printed, glossy or flat finish
- Fast changeover from one blister to another
- Auto recognition of blister tooling and test parameters
- Quantitative and repeatable
- Rapid test time
- Pinpoints defective blister cavity
- Flexible bladder increases sensitivity, reduces headspace and compensates for material variations
- Based on ASTM vacuum decay leak test method* with addition of vision technology to ID defective blister cavity
- Eliminates cost / waste of destructive testing

*ASTM Vacuum Decay Test Method F2338-05 (www.astm.org) was developed using VeriPac leak test instruments. This test method is recognized by the FDA as a consensus standard for package integrity testing.

About PTI

Packaging Technologies & Inspection (PTI) is a leading manufacturer of non-destructive inspection technologies for the pharmaceutical, medical device, food and container industries. Recognized as a thought leader in new delivery systems for seal, package and container integrity testing, PTI has set the standard for inspection systems that provide repeatable, reliable results. Having a PTI inspection solution in place for QA/QC process control guarantees that your package is “fit for purpose” from manufacturing through distribution.