



FROM BULLET-PROOF TO WATER-PROOF:

Body armor manufacturer needs an upgrade

CHALLENGE

A US manufacturer of body armor for law enforcement and military markets needed a more effective way to test the integrity of their ballistic packs used in bullet proof vests. The ballistic material must be kept dry in order for it to meet performance expectations.

If water is allowed to ingress into the ballistic material, it would degrade and put the user at risk. Their ballistic material is protected in a waterproof heat-sealed envelope or package. In order to verify its integrity, each package must be leak tested.

The manufacturer contacted LACO because its existing leak testing method of submerging their product under water was messy, slow, insensitive, and if a package leaked, the ballistic material had to be discarded. The challenge was to develop a technique to leak test (both gross and fine) for a sealed package.

SOLUTION

LACO developed a test method called "force decay". The process of manufacturing the vests naturally traps some air within them. LACO designed a custom test chamber create internal pressure on the package by evacuating the chamber. The inflated package would create a force against the force gauge. If the package had a gross leak, the package would deflate very quickly or not inflate at all.

For smaller leaks the force gauge would measure the pressure loss as the package slowly deflates. By carefully calculating the reduced pressure over time, a leak rate for the product could be established

providing the manufacturer a fast, simple, non-destructive way to evaluate each ballistic pack.



Body Armor Leak Testing Vacuum System