

Passing Shock Tests with Flying Colors

O Problem:

One of our competitors provided a customer with an isolator for a bulkhead-mounted enclosure with an internal circuit card deck that ultimately failed 901E shock testing.

Solution:

A precision system analysis, the creation of a custom elastomer blend for an existing isolator design and a mounting system redesign to better control motion and acceleration.

Results: O-

The elastomer blend we created was 50% stiffer than the standard elastomer, enabling the isolator to use half of the allowable deflection space. The upgraded system stayed within the client's max acceleration levels—and passed the shock test. From trains to electric vehicles, to the defense industry and beyond, there are many important uses for engineered shock, vibration and motion control solutions. At Hutchinson, we combine our system design and analysis skills with our ability to develop innovative, custom vibration and isolation products that provide unrivaled results.

That's why one well-known defense company, which was working on electronic control equipment for the United States Navy, came to us at the 11th hour to ask if we could help solve a shock testing problem that a competitor could not. Our extremely knowledgeable engineering and materials team quickly diagnosed the issue and ultimately created a successful solution that eliminated the need for a complete redesign—saving the customer about a year of time and money in the process.

Understanding the Problem

This defense customer had a bulkhead-mounted enclosure with an internal circuit card deck that had a limited amount of deflection space to stay within the maximum acceleration requirements. The defense company had reached out to one of our competitors who supplied an isolator along with a proposed isolator configuration that they claimed would meet these requirements. However, it did not.

When the defense company began 901E shock testing on the bulkhead-mounted enclosure, they quickly learned that our competitor's solution was insufficient: it allowed for high acceleration levels to be transmitted through the internal circuit card assembly during a shock event, resulting in a failed test.

Faced with limited time and an inadequate product, the defense company asked us to solve their shock problem by whatever means necessary.

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A Stiffer Solution

We utilized our in-house proprietary software to analyze the system with the customer-provided time/input history. We soon determined that a custom elastomer blend for an existing isolator design was required to achieve the company's desired acceleration requirements and pass the shock test.

With this analysis in hand, our engineering and materials teams worked to compound a candidate elastomer that needed to be 50 percent stiffer than the standard elastomer. The engineering team also found that using stabilizer mounts at the upper corners of the system's card deck would allow for better control over motion and acceleration.

Saving Time and Money with Results

After we showed the defense company the predicted performance of our newly developed isolator, we provided samples for them to use in trial testing. By using the stiffer elastomer, we were successful in meeting the company's maximum acceleration levels while using half the allowable deflection space. This new isolator and proposed isolator configuration also passed all shock testing requirements. Our design and analysis support saved the customer from having to go back to the design phase to redesign the whole assembly—a process that would have taken about a year of time and cost.

This success story illustrates how Hutchinson provides high-quality and customizable shock and vibration solutions that eclipse the competition. Through a comprehensive system analysis and the creation of a brand-new material, our team was able to help the customer get their project back on track while saving them time and money in the process.

 We supply old, new and custom-designed mounts to meet Navy specifications MIL-DTL-901E, Mil-STD-167,
MIL-DTL-17508G, and MIL-PRF-32407A. If you are looking for vibration isolation mounts for your project, a custom solution—or even engineering support such as system design and analysis—reach out to us today.