

Case Study: Combined Environment System Zero Field Failures: Importance of Environmental Testing

Namibia, Africa-based company Sat-Com Communications Solutions prides itself on being a 100% Namibian company. Founded in 1996, Sat-Com originally manufactured television and FM-radio transmitters and other broadcasting equipment. Now, Sat-Com focuses on manufacturing products for the military/defense sector, primarily man pack and base station Multiband-SDR-Radios.

Sat-Com's goal is to manufacture world-class products, that are designed, tested, and verified to meet military specifications such as MIL-STD 810G. Due to the company's geographical location and the country's lack of supporting industry, Sat-Com invested in all the technologies and manufacturing processes required for their business, making them one of only a handful of manufacturers in the country.

"This allows us to continually improve our products and implement new technologies, thus ensuring our competitiveness and ability to address customer needs sooner than big enterprises," said Glen Brown, Manager of Mechanical Engineering at Sat-Com. "It has also allowed us to expand our offerings to include other radio accessories such as antennas, high power amplifiers, power supplies, intercoms, and head sets."

Sat-Com radios are primarily used in aircrafts and vehicles in harsh environments worldwide. The company's engineers strive to develop products to withstand even the most rigorous conditions. "Environmental testing is an absolute prerequisite to achieve these objectives," Brown said. "Doing environmental tests is a must for any reputable company."

"We take testing very seriously. Through thorough market research we were able to source the most appropriate equipment for our products," explained Brown. When researching their chamber and shaker purchase to test their product Sat-Com looked for equipment that would simulate a wide range of temperature and vibration levels ideally from a single supplier. Because Thermotron fit these requirements, Sat-Com purchased a Thermotron combined system, which included an AGREE chamber (model number F-16-CHMV-5-5) that simulated temperature and humidity with a removable floor to interface with an electrodynamic shaker (model number DSX-2250) for simultaneous vibration testing. Both pieces of equipment can be used as standalone units as well.

Buying from a single-source supplier, mitigated an expensive integration, and ensured the chamber and shaker would work seamlessly together. As a bonus, support and service was coming from the same company as well.



Sat-Com Mechanical Engineering Manager, Glen Brown, bought their chamber-electrodynamic shaker combined system from Thermotron because they are a single-source supplier, ensuring that the equipment, service, and support would work seamlessly together.

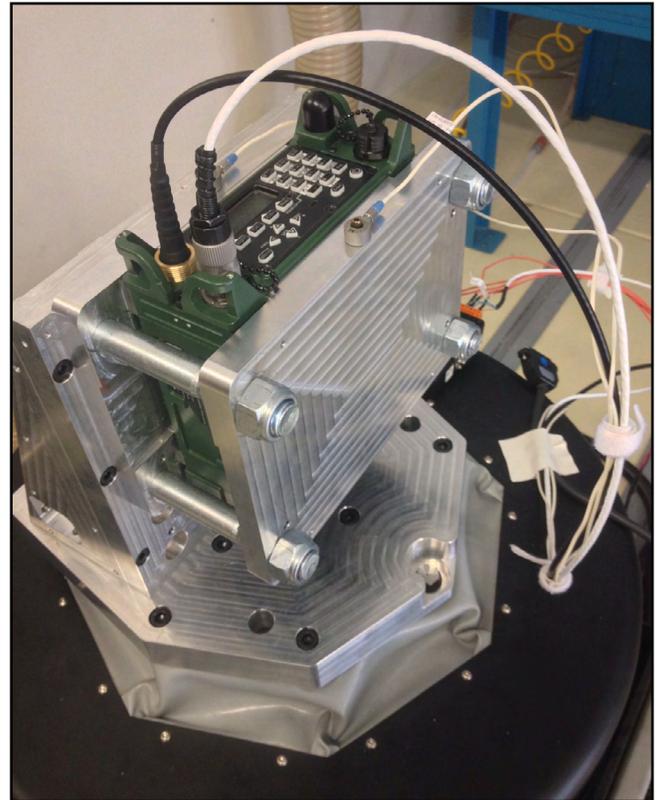
Thermotron equipment comes with pre-programmed profiles in the controller. "Using the combined system controller helped speed up testing time, because we didn't have to spend hours programming the appropriate parameters and limits of the test and products," said Brown.

"We know we can rely on Thermotron for help and support if we had questions about testing or the equipment itself," said Brown. "The chamber and controller are also intuitive, and service is quick and accessible if needed."

Sat-Com found multiple benefits while testing their products in their Thermotron equipment. Testing allows for purposeful destructive tests by forcing failures. Engineers test their products to the extreme to see at what point they stop functioning, and expose areas of improvement. Forced failure tests are useful in finding the weakest point of a product by exposing them to exaggerated high and low temperatures, together with vibration and shock. For example, Sat-Com batteries failed expected specification in extreme cold, below -12°C. Environmental testing helped Sat-Com engineers find a better, more reliable battery cell to use in these frigid conditions.

The environmental testing can reveal unpredictable product shortcomings before it is released to the consumer. Sat-Com, for example, found that the an aluminum cap that protected radio connectors from dust and other debris became difficult to remove after being exposed to high temperatures due to the expansion of the aluminum. "Using a material with a different expansion coefficient was an easy fix, a shortcoming we would have neglected to address without doing environmental testing. Since using the new material, there have been no problems."

Testing with a Thermotron chamber and shaker helped Sat-Com find and fix product defects before reaching the consumer. Since acquiring Thermotron equipment they have achieved their goals to eliminate failures due to environmental conditions. This has reduced the costs of sending service and integration specialists to the field to investigate problems, enabling Sat-Com to stay true to its commitment of providing world class products to their customers.



A Sat-Com radio is secured in a product fixture in preparation for simultaneous temperature, humidity, and electrodynamic vibration tests.

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