



**For a Total Solution to all of your  
Materials Testing Needs**

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## ADMET ExPress Enables Niacc-Avitech Technologies to Add Aircraft Shock Absorber Repair Service

*Niacc-Avitech Technologies is an aircraft component overhaul and manufacturing facility in Fresno, CA. A subsidiary of HEICO Aerospace, the company repairs and overhauls starter/generators, fuel assemblies, cable harnesses and electronics, brake and hydraulic components, and other aircraft appliances and components. It also offers specialized winding services, non-destructive testing, specialized plating and precision grinding services, as well as test equipment design and fabrication. The company also has a build-to-print division that supplies major customers with electrical rotors, starters and wire harnesses.*

*Niacc recently received a customer request to add overhaul capabilities for landing gear shock absorbers to its portfolio of services. The technical specifications required load vs. position and cyclic properties certification of shock absorbers according to OEM specifications that would require new test equipment. Niacc head of engineering and product development, Rayan Kabeer, discovered that an ADMET ExPress Universal Testing Machine equipped with the MTESTWindows™ materials testing system met his needs.*

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Niacc-Avitech Technologies is an FAA/JAA-certified Repair Station in Fresno, CA. Over its 25 years in business it has developed a number of compliant repair and overhaul capabilities for regional and commercial aircraft.

The HEICO Aerospace unit services electrical/electronic, fuel, hydraulic and mechanical aircraft appliances and components. Its customers, operators and airlines, turn to Niacc because of the quality and timeliness of its work.

One customer, which flies Embraer EMB-145 aircraft, requested that Niacc service the landing gear shock absorbers for their aircraft.

Explained Rayan Kabeer, Niacc head of Engineering and Product Development, "We told them we would look at it. We reviewed the Component Maintenance Manual (CMM) and determined the acceptance test specifications."

One of the requirements was the verification of a load vs. position specification that would require

Niacc to purchase new equipment. Kabeer sought equipment that could perform compression, extension and cyclic tests on the shock absorbers at 49,000 lbf.

### **Extensive testing procedure**

Some shock absorbers, depending on whether they are in for a scheduled overhaul or for an unscheduled failure, are tested as they are received. The parts then go through disassembly, assembly, inspection and final acceptance as specified in the CMM. All shock absorbers are tested before they leave the Niacc facility.

Kabeer explains the final inspection process:

"The first test is the proof-pressure test where we mount the shock absorber on the test set and deflect it to a certain length; we then charge it with hydraulic fluid and look for any failure; we add a charge of nitrogen and put it on the stand again; we cycle it six times with both the nitrogen and hydraulic charges to see if there's any external leakage.

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## **SOLUTION OVERVIEW**

**Industry:** Aircraft maintenance

**ADMET Product:** ExPress 300kN with  
MTESTWindows Materials Testing System

**Customer:** Niacc-Avitech Technologies

**Application:** Test aircraft shock absorbers

“Lastly, there is a final functional test where we put it back on the test set and monitor any obvious pressure drops; we compress it to a certain deflection and check the load to make sure it falls within a graphing limit provided by the manufacturer.”

### **Challenge finding right test equipment**

Kabeer researched some specialized test equipment suppliers but found that the equipment ranges were either too high or too low.

“The load issue was one of the real challenges,” he said. “For this type of shock absorber we were looking into 49,000 pounds. Everything the other company had was too big or too small. They could have custom made it, but it would have taken a tremendous amount of time.”

Niacc would have also had to buy separate LVDTs (Linear Variable Displacement Transducers) that would add cost and complexity.

### **ADMET’s custom design**

Kabeer found ADMET, with its full range of universal testing machines, on the Web and then called the company. “We talked with ADMET about load and pressure and what the requirements were,” he said. “We gave them all the parameters that we needed and there was a lot of back and forth. They pretty much said, ‘we can do it.’”

ADMET specified an ExPress 300 kN (60,000 lbf) dual-column servo-hydraulic materials testing machine with a top mounted actuator (as specified in the CMM). ADMET also recommended the MTESTWindows Materials Testing System, a Microsoft Windows-based software product that

controls tests, collects and reports data, and offers sophisticated tabular and graphical representations of test results for analysis and comparison.

### **Handles test control/analysis/reporting**

The unit arrived within six weeks. Niacc handled the setup and then called in a calibrator. Kabeer installed the software on an existing computer that is now dedicated to the process.

“We just had to hook [the machine] up with our computer and then load the software. We installed the load cell ourselves ... it was pretty much plug and play,” he explained.

Kabeer especially likes MTESTWindows. “The best thing about ADMET is that, with their software, we can control [the test] pretty much hands-off,” he said.

MTESTWindows also graphically plots the test results and highlights any test parameters that are out of tolerance making it easy to spot failures.

The results are saved in a database that, by regulation, are kept for two years after the part has been shipped.

With the ADMET equipment, Niacc was able to respond to its customer’s request for a new line of testing and is now providing the service to other customers that operate EMB-145s.

Incremental business is possible since the Bombardier CRJ-200 aircraft uses the same type of shock absorber and, with a 60,000 lbf capacity, the ExPress can be used to test larger shock absorber assemblies further extending the market.



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### **For more information:**

For more information about ADMET products or services, please call us at 800-667-3220 or 781-769-0850, email [sales@admet.com](mailto:sales@admet.com) or visit our Web site at <http://www.admet.com>.

For additional information on Niacc-Avitech Technologies, visit <http://www.niacctech.com>.

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