



ABOUT US

Aviation Consulting & Engineering Solutions, Inc. (ACES) was formed in 1999 to provide FAA DER certification services to the private, business, and commercial aviation industries. Our staff includes DERs, Engineers, and Managers with experience working at airframe OEMs, Seat Manufacturers, and first tier suppliers.

SERVICES AT GLANCE

FAA DER (Designated Engineering Representative)

Structures
Flammability
Mechanical Systems
Electrical Systems
Software

ENGINEERING

Mechanical Design
New Product Development
Structural Analysis
3D Scanning

FLAMMABILITY TEST LABS

Bunsen Burner
Seat Cushion Oil Burner & Next Gen Oil Burner
Heat Release
Smoke Density & Toxicity
Cargo Liner (Flame Penetration)
Full-Scale ULD/FCC (Cargo Fire Containment)
Insulation Burn-through
Powerplant (Vibration, Air Flow, Pressure/Vacuum)
Flame Propagation (Radiant Panel)

STRUCTURAL TEST LABS

Galleys, Tables, Partitions, Bulkheads, etc.
Slip Testing for Floor Surfaces
Static Testing of Seats
Personal Flotation Device Buoyancy Testing
Cyclic Fatigue/MTBF
Material Qualification (including composites)
Component Testing (inserts, panel pins, adhesives)

REGULATION AWARENESS

At ACES, to keep up with the ever-changing FAA requirements and test methods for 16G Seat Certification, Structural Approvals, and Flammability Certification, we participate in the International Fire & Cabin Safety Conferences, Materials & Fire Protection Working Groups, and the SAE Seat Committee. ACES also participates in FAA Round Robin flammability testing to stay involved with the development and continued improvement of test methodologies. In 2016 we participated in FAA Tech Center Round Robin Flame Propagation testing of insulation materials, and our results were ranked #1 for consistency and accuracy.

OUR CUSTOMERS

Our customers are the lifeline of our business. We continuously strive to foster and grow relationships through active listening and a customer-centric approach. We take pride in supporting each customer's individual project goals and schedules.

OUR PROMISE

Each project at ACES is approached in a unique manner, using a simple but comprehensive process tailored to meet your needs and requirements. Our dedication to our customers is to enhance your experience with ACES by reducing your efforts, to increase your productivity and efficiency.

FLAMMABILITY TESTING

- ▲ **Bunsen Burner Testing⁺**
 - ▲ 12 & 60 Second Vertical Appx F Part I
 - ▲ 45° Baggage Panels Appx F Part I
 - ▲ 2.5 & 4.0 IPM Horizontal Appx F Part I
 - ▲ 60° Wire / Cable Appx F Part I
- ▲ **Seat Cushion Oil Burner*⁺** Appx F Part II
- ▲ **Cargo Liner** Appx F Part III
- ▲ **Heat Release Rate** Appx F Part IV
- ▲ **Smoke Density** Appx F Part V
- ▲ **Thermal/Acoustic Insulation**
 - ▲ Flame Propagation⁺ Appx F Part VI
 - ▲ Burnthrough Appx F Part VII
- ▲ **Toxicity Testing**
- ▲ **Fire Containment** 25.853(h)
- ▲ **Powerplant Fire Penetration**
- ▲ **Powerplant Vibration & Backside Air Flow**
- ▲ **Magnesium Alloy Seat Structure**
- ▲ **Full-scale cargo container (FCC, ULD) tests (Class A and Class D)**

⁺Parts 23, 25, 27, and 29, as applicable

*ACES stocks a variety of seat cushion foams, as well as fireblock materials for quick turn around times and customer convenience.

Live video feed for remote test witnessing is available for all tests.

CERTIFICATION

- ▲ **“16G” Dynamic Seats**
 - ▲ Test Plans and Approvals
 - ▲ Test Witnessing for TC, STC, PMA & TSO
 - ▲ PMA Replacement Cushion Development
 - ▲ Composite Seat Structure Development and Testing
- ▲ **Interior Compliance Inspections**
- ▲ **Project Specific Certification Plans**

SEAT CUSHION ENGINEERING

ACES has replacement seat cushion engineering data, and can provide custom upholstery modifications to seat cushions for added comfort or unique styling, for many business jet aircraft seats that are certified to the dynamic test criteria in 14 CFR 23.562 or 25.562. Our data has been approved and/or validated in the USA, Canada, and Europe (EASA). Seat modifications are carried out in accordance with FAA Advisory Circular AC 21-25B. In addition, ACES can provide engineering data and approvals for dress cover replacements for any aircraft, including rotorcraft, as well as 9G seat modifications.

Our engineering capabilities include a team of engineers with specialties in the areas of: 16G seat certification, mechanical design, structural analysis, mechanical & electrical systems, and software.

16G Seat Cushion Data - Supported Aircraft

- ▲ Boeing BBJ
- ▲ Bombardier Challenger 300, Global Express, Global 5000, Global 6000
- ▲ Cessna (Textron) 525, 525A, 525B, 525C, 560XL, 680, 750
- ▲ Dassault Aviation Falcon 2000, Falcon 2000EX, Falcon 7X
- ▲ Embraer EMB-135BJ, EMB-550
- ▲ Gulfstream G150, Galaxy/G200, GIV-X, GV, GV-SP, GVI, G650
- ▲ Learjet 45, 45XR

For any aircraft not identified above, please contact us. We may be able to work with you and develop data for your specific application.

STRUCTURAL TESTING

- ▲ Static pull tests for seats, cabinets, interior monuments & individual components.
- ▲ Tension & Compression Testing for inserts, panel pins, fasteners, webbing, fittings, etc., including statistical development of A- & B-basis strength data.
- ▲ Slip resistance testing to 14 CFR 25.793 for flooring materials, i.e. carpeting, vinyl, rubber, etc.
- ▲ Flotation tests for personal flotation devices in accordance with TSO-C72b.
- ▲ Cyclic tests for fatigue and MTBF evaluation.
- ▲ Material, component, and full-scale testing of composite seat structures

Live video feed for remote test witnessing is

ANALYSIS & DESIGN

From individual components, monuments, partitions, structural modifications, antenna installations, avionics equipment installations, and seat installations, to entire interior reconfigurations, the ACES engineering department supports a large variety of modifications, and can analyze and certify any size project. Analyses are performed using both traditional methods and Finite Element Modeling and Analysis. ACES can also provide 3D scanning at your aircraft to capture installation data or to document a new component design.

ACES can also support 16G seat design utilizing composite materials, including material qualification, damage assessment for composite-related process development and approval, as well as component and full-scale static and dynamic testing.

CONTACTS

Kevin C. Campbell, President & Founder
Kevin@aces.aero

Donna Wetzel, Manager
Donna@aces.aero

Jeff A. White, Engineering Manager, DER
Jeff@aces.aero

Paul Nething, Certification Engineer, DER
Paul@aces.aero

Cooper Buchholz, Flammability Specialist
Cooper@aces.aero

Robin Irvin, Flammability Specialist
Robin@aces.aero

FACILITY EXPANSION

October 8, 2020 is our official Grand Opening for our facility expansion. We are excited for this new chapter, and have expanded our testing capabilities considerably. We have built a total of seven new test labs, and have additional testing machines (flammability and structures), with a newly designed conditioning room. These upgrades and redundancy help us to maintain our industry-leading turn times while increasing our capacity.

Thank you to all of our customers, employees, vendors, families and friends who have supported us throughout the years making this expansion and exciting new chapter at ACES possible.

Aviation Consulting & Engineering Solutions, Inc.

www.aces.aero
7718 W. 53rd St. North
Maize, Kansas 67101 USA
Phone: +1.316.265.8335