STATEMENT OF WORK

Piston Aviation Fuels Initiative (PAFI)

Materials Compatibility Testing

February 2026

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1.0 Introduction

1.1 Objective

The objective of this contract is to obtain materials compatibility laboratory test and evaluation services related technical expertise to assist the FAA Piston Aviation Fuels Initiative (PAFI) and the Eliminate Aviation Gasoline Lead Emissions (EAGLE) programs.

1.2 Background

The Federal Aviation Administration Aviation Research Division is the primary research organization supporting the FAA's PAFI and EAGLE programs. These programs lead the FAA's research efforts to identify and authorize unleaded fuel replacements for current 100 octane low lead (100LL) aviation gasoline, the only remaining transportation fuel in the US that contains lead additives. In the 2024 FAA Reauthorization Act, Congress has set a goal for the FAA to transition industry to lead-free aviation fuels for piston-engine aircraft, by the end of 2030, without adversely affecting the safety of the existing fleet. The efforts under this contract are one part of a comprehensive evaluation effort being conducted by the FAA and its Industry partners on unleaded fuel candidates to achieve the agencies' objectives and Congressional goals.

2.0 Scope

Except as noted under paragraph 9.0 Government Furnished Information, Facilities, and Equipment, the contractor must provide all necessary technical, engineering, operations, administrative, and other support, as well as all facilities, equipment, materials, and supplies required to perform materials compatibility test and evaluation of unleaded candidate fuel in accordance with this Statement of Work and accompanying documents.

Because of the highly sensitive nature of this research, Contractors must be prepared to abide by the specific intellectual property requirements specified herein. Furthermore, the FAA may use the services of other contractors, consultants and/or industry representatives to assist in these efforts. All personnel involved in supporting or assisting in this effort will be similarly required to abide by the same requirements.

3.0 Requirements

3.1 Program Management

3.1.1 Post-Award Conference.

The Contractor must participate in a virtual post-award conference that will be held within fourteen (14) calendar days after award. The purpose of the conference is to aid both Contractor and the Government in achieving a clear and mutual understanding of all requirements and to identify and resolve potential issues ahead of time.

The FAA is responsible for establishing the time and place of the conference and will notify the Contractor. The Contracting Officer Representative (COR) will act as the chairperson at the conference or will provide a designee. The chairperson of the conference will be responsible for the conduct of the meeting. A completed Non-Disclosure Form (attached to this SOW) must be provided three (3) *business* days in advance of the meeting to the Contracting Officer (CO) and Contracting Officers Representative (COR).

Within twenty-eight (28) calendar days after the Post-Award Conference, the Contractor must provide the following items to the FAA COR in writing:

1. List of Contractor Points of Contact, including contact email, role, mailing address, and phone numbers.
2. Proposed schedule of the Test Activities (see paragraph 4.5). Contractor must prioritize completion of the MTP-002 Table D-1 Polysulfide Sealant testing (not the Table D-2 Polysulfide Sealant Validation List) in its planning and test conduct efforts.
3. Shipping address(es), phone number, and contact information for fuel deliveries and the government furnished property referenced in paragraph 11.0 Shipping.

3.1.2 Status Meetings/Teleconferences.

The Contractor must participate in one hour or less status videoconferences on a weekly basis, or as otherwise as approved by the COR, to review overall project status including schedule progress, test activities and results, questions and issues arising from the testing, and other information. The FAA COR will coordinate these meetings and act as the meeting Chair. When the FAA COR may be unavailable or directs so, a written summary status report of 1-2 pages in Contractor format that provides the above information, will suffice in lieu of the videoconference. The contractor format will be agreed upon at the beginning of the contract period.

3.2 Technical Tasks

Attached, and incorporated into this SOW by reference, are the PAFI Materials Test Matrix, PAFI MTP-002, RTP-001, RTP-004, RTP-005, RTP-009, and RTP-010 (see section 12.0 References, for full titles of these documents). The Contractor must conduct test and evaluation on the specific

materials detailed in these documents, according to the methods specified. The PAFI Test Matrix provides a detailed list of all the test materials, number of samples, and references to test protocols, test plans, test methods and/or standard(s) for test conduct of materials compatibility, as well as other relevant information. PAFI MTP-002, RTP-001, RTP-004, RTP-005, RTP-009, and RTP-010 specify FAA specific protocols and materials to be tested for compatibility testing.

Following is a summary of the tests, analysis, and other support to be performed by the Contractor:

a) Execute compatibility screening of fuel-wetted metallic materials.
b) Execute compatibility screening of fuel wetted non-metallic materials, slab stock flat stock.
c) Execute compatibility screening of fuel wetted non-metallic finished parts.
d) Execute compatibility screening of aircraft paint systems for adhesion, hardness, and fuel drip effects.
e) Execute compatibility screening of specified integral fuel tank sealants related to changes to tensile/elongation, hardness, volume swell and peel strength properties.
f) Execute comparison testing of fabric tensile/elongation of specified aircraft fabric systems.
g) Execute compatibility screening of specified nitrile, fluorosilicone, and fluorocarbon elastomers in the form of O-rings, related to changes in hardness, tensile/elongation, volume change and compression set.
h) Execute compatibility screening of MIL-DTL-6000 Hose, Rubber, Aircraft, Fuel, Oil, Coolant, Water, And Alcohol and MIL-DTL-5593 Hose, Aircraft, Low Pressure Air and Vacuum, Flexible, related to determining swell characteristics, and changes in swell and tensile/elongation properties.
i) Execute compatibility screening of commercial fuel distribution hoses,
j) Execute compatibility screening of specified fuel bladder construction related to degradation and delamination of the internal lining.
k) Execute comparison testing of specified resins, adhesives, foam cores, and fabrics used for composite structure construction.
l) Execute compatibility testing of filter elements, coalescer elements, housings, and fuel tank coatings used in distribution systems.
m) Execute compatibility testing of vendor supplied materials used by original equipment manufacturers.
n) Execute comparative Cold Flow Rig Testing of fuels.
o) Execute Storage Stability Rig Testing of fuels .
p) Execute Storage Stability Rig Testing of fuels (accelerated storage stability and related portions of the testing only).
q) Execute Cold Storage Freezer Testing of fuels.
r) Execute Dynamic Diaphragm Testing with fuels.
s) Execute Sump Drain Valve Testing with fuels.
t) Support EAGLE and PAFI meetings and conferences, either remotely or in-person. This includes making personnel involved in testing available to review and discuss test procedures, results, as well as to answer questions from other participants, provide other information, and expert advice as required by the FAA.

3.3 Fuel Handling Retention and Disposal

The Contractor will use test fuels as specified for the performance of this work, including industry standard 100 octane Low Lead (100LL) and unleaded test fuels. The unleaded fuel(s) will be provided directly by the FAA at no cost to Contractor. Contractor is responsible for obtaining industry standard FBO 100LL avgas, as well as any other test fluids specified to be used in performance of this testing.

Use of fuels during the test program requires bulk handling and storage of experimental fuels. The Contractor will ensure proper handling, storage, and labeling of fuel storage vessels to appropriately segregate test fuel, 100LL, and any reference fuels or fluids during the conduct of testing.

Prior to, during, and after completion of testing, all fuel used in the testing must be retained and properly stored in sealed, stainless-steel, laboratory grade amber glass, or other containers that are approved by the FAA prior to the start of testing. The containers must be properly marked to indicate the specific fuel or fluid and lot or batch number as applicable. If the Contractor plans to reuse any storage containers during testing, Contractor must submit a proposed cleaning protocol to the FAA for review and approval fourteen (14) calendar days for review prior to commencing container cleaning and reuse. The FAA will provide comments and/or suggested changes that must be addressed prior to cleaning and reusing containers.

At the conclusion of testing and at the FAA's request, any remainder of the unleaded test fuels must be returned to: 1) the FAA WJHTC, 2) the fuel supplier, or 3) disposed of in accordance with all local, state, federal regulations. This includes fuel at sub-contractor or partner locations. Shipping and/or disposal costs for the unleaded test fuels only, will be reimbursed as an ODC in accordance with the requirements herein. Disposal of unleaded test fuels may only occur with prior written approval by the FAA and proof of disposal must be provided. Contractor will be responsible for disposal of other reference fuels and fluids used in testing once the FAA has accepted that a test is completed per paragraph 4.8 Test Data.

3.4 Sampling and Analysis

The Contractor must collect, package, label, and ship samples as specified, including hazmat packaging and shipping requirements. The Contractor must comply with all local, state, federal regulations covering the shipping of hazardous material.

All analysis of samples will be completed by the FAA at no cost to the Contractor.

The Contractor will be provided a Safety Data Sheet for the unleaded fuel to be tested. The Contractor must not conduct any chemical or physical property analysis of its own on unleaded fuels samples, in accordance with non-disclosure provisions of this contract.

4.0 Deliverables

The Contractor will provide all deliverables in compliance with this SOW and accompanying documents.

4.1 Access and Use of Information

Because of the highly sensitive nature of the information, including any/all data, photographs, descriptions, reports, findings, analyses, or any other information pertaining to all aspects of this

testing, Contractor employees, consultants, officers, agents or other representatives of Contractor, their sub-contractors, partners and teammates (hereafter referred to as "Contractor Team-Member(s)") who may have access to such information, must execute a copy of the non-Disclosure Agreement (NDA) prior to being provided access to said information.

The responsibility of ensuring that Contractor Team-Members involved in this work comply with the requirements of all NDA's as well as requirements contained in this SOW is the responsibility of the Contractor.

4.2 Documentation Review

Prior to submittal of all Deliverables under this contract, the Contractor must analyze documentation for technical correctness and validation of requirements against this SOW. The Contractor must track comments submitted by the FAA, coordinate with the FAA for discussion, and document the resolution of FAA submitted comments.

4.3 Data Presentation Requirements-General

All deliverables must be submitted in electronic file format via email to the COR unless otherwise agreed to by the FAA. The FAA email system will accept attachments up to 25mb in size per email message. Electronic files will be in a format compatible with MS Office 2016 (Word, Excel, PowerPoint), or other formats as specified herein. General graphic or photographic data (charts, plots, photos, etc.) embedded within MS Word or PowerPoint files must be in 24-bit color. The accompanying source data for all charts and graphs must be provided in Excel along with source charts, tables, and graphs. All Scanned copies of documents where originals were hardcopies, including log books, inspection forms, etc. must be provided in Adobe Acrobat (.pdf) format, version 1.7 or later, at a minimum resolution of 300dpi in color if the original document contained colors, or in black and white if the original documents were black and white only. Photographs or other still images must be JPEG format with a minimum resolution of 3032x2008 (6 Megapixel) and either a 4:3 or 16:9 aspect ratio. Video files must be in MP4 format with either a 4:3 or 16:9 aspect ratio and at a resolution of 720p or higher. All photographs and video recording should show a date and time stamp automatically recorded by the camera. The Contractor may propose alternative file formats and/or resolutions subject to FAA acceptance.

The Contractor is not responsible for late delivery of undelivered/undeliverable electronic files submitted within the size and type guidelines above but rejected by the FAA email system.

The FAA may, in its sole discretion, opt to share information from this research with any company providing unleaded test fuels and other organizations involved with EAGLE and/or PAFI. To facilitate this, the Contractor must segregate raw, as well as compiled report data for each comparison of baseline fuel/fluid and each unleaded test fuel, such that information on each

unleaded fuel resides on individual pages of raw data or is grouped together within individual sections of reports, separate from other unleaded fuels sections.

Specific Deliverables include the following:

4.4 Deliverable Tracking List

The Contractor must maintain a Summary table/list of all deliverables. At a minimum the list must include for each deliverable: a unique sequential number, file name, including Windows file extension (.docx, .xlsx, .pptx, .pdf, etc., the test and the fuel that the deliverable applies to, a short description of the deliverable contents, and the date submitted to the FAA. The list must be in MS Excel format and submitted in electronic format. With each new deliverable or set of deliverables submitted on the same calendar day, the Contractor must submit an accompanying updated list.

4.5 Program Schedule

Schedule of the Test Activities including: the planned locations (address, subcontractor name) for each test, the planned start and end dates for each test and the actual start and completion dates. The schedule must be in MS Excel or MS Project format and must be provided electronically. Contractor must prioritize completion of the base CLIN polysulfide sealant testing (not including the Polysulfide Sealant Validation List) in its planning and test efforts. The FAA will provide input to prioritize and sequence testing of other materials, which the Contractor will consider in its planning and resource allocation of test facilities and personnel.

4.6 Monthly Report

Within seven (7) calendar days from the end of the previous month, the Contractor must submit a monthly status report in MS Word unless otherwise agreed to by the FAA. The report must describe the work accomplished during the reporting period, work planned for the next month, discuss problems encountered and corrective actions taken, and identify pending issues. Additionally the report should provide an estimate of the burned hours/work effort/budget as appropriate in the preceding month, including estimates of approved Subcontract costs and ODC's that have been expended. The report must address the extent to which any problems or circumstances could cause delays in schedules.

4.7 Test Data

Test Records: For ongoing test, records including daily inspection logs, photographs, other test data sheets, preliminary test results, and other data items called for in the Test Plans must be provided within seven (7) calendar days from the end of the previous month. For tests that have completed, the Contractor will provide any remaining test data within seven (7) calendar days from the end of the test.

4.8 Test Reports

After completion of each of the individual material tests specified, the Contractor must provide separate final reports for that particular test. Each of the reports must include the data, findings, analysis, and conclusions specific to one unleaded test fuel vs 100LL and/or other baseline test fluids. Each report must segregate information for each individual unleaded fuel in the same report, or submit separate reports for each unleaded fuel, in accordance with paragraph 4.3 Data Presentation Requirements-General.

The reports must be prepared in Microsoft Word format in accordance with the attached document "PAFI Materials Test Minimum Reporting and Format Requirements". The reports must detail all aspects of test procedures, including but not limited to test dates, test articles, test participants, and test results for each test activity and details of exceptions or test thresholds that could not be achieved along with any photographs taken. The reports must also provide a conclusion of whether the test(s) were compliant with the provided pass/fail criteria.

A draft of these reports must be provided within thirty (30) calendar days of conclusion of testing of the specific material section (CLIN). The FAA will review and provide comments on the draft reports within twenty (20) calendar days of receipt. Contractor will disposition comments and updated final reports must be completed and submitted within another twenty (20) calendar days.

4.9 Trip Reports

After completion of approved travel, Contractor must submit a Trip Report that includes at a minimum: Date(s) and location(s), Contractor participant personnel, other organizations and participants, Purpose, Key points of discussion, any key decisions, outcomes, and action items.

5.0 Place of Performance

Contractor will perform testing at locations in the Continental United States (CONUS). Outside the Continental United States (OCONUS) locations must be pre-approved by the Contracting Officer. No foreign test locations may be used.

6.0 Period of Performance

The Period of Performance (PoP) is thirty-six (36) months.

7.0 Contractor Safety and Handling

Due to the potential deviations from traditional petroleum chemistry, it is important for test facilities to have a copy of the health and safety information provided with the samples. While the actual formulations are proprietary, the Contractor must ensure they have the following information on hand. Information relative to the specific fuels will be provided by the FAA.

- A Safety Data Sheet (aka SDS, MSDS) sufficient for shipping samples. This includes a 24-hour

emergency contact number.

It is the sole responsibility of Contractor to determine whether the provided SDS or MSDS are sufficient for the safe handling and disposal of the fuel and fuel contaminated materials.

The Contractor must use appropriate PPE, whether standard or non-standard. Standard PPE is that used for current petroleum products, including but not inclusive, nitrile gloves, eye protection, and laboratory coats or aprons. The Contractor must ensure that appropriate fire prevention and extinguishing methods, as well as those for electrical/static discharge protection are followed as required.

The Contractor must comply with all local, state, and federal regulations for storage, distribution, and disposal of test fuels and parts exposed to same as applicable. This includes any special segregation, any disposal incompatibilities (materials with which the test fluid should not be mixed), or any special handling required.

8.0 FAA Test Participation and Inspection

Multiple FAA organizations and representatives may participate in efforts under this contract. In addition, the FAA may use the services of other contractors, consultants and/or industry representatives to participate in these efforts. Any changes to testing, plans, schedules, or other portions of this contract that affect scope, schedule, or cost, must only be coordinated with the FAA CO or COR.

The Contractor agrees to provide unrestricted access to the FAA and its representatives of activities conducted under this SOW. Access may involve participation and inspection of all aspects of test preparation, fuel handling, any and all testing performed, data collection and analyses and other activities performed in support of this effort. The Contractor agrees to provide any and all access and test related information requested by the FAA CO or COR. The Contractor must provide ten (10) calendar days advance notice prior to initiation of each test segment to allow the FAA time to coordinate its participation and/or observation of the test.

9.0 Government Furnished Information, Facilities, and Equipment

The FAA will provide, within forty (40), calendar days after contract award, the following consumable items to be used by the Contractor to accomplish the work under this SOW. Unused items will be returned at the completion of the work.

Table 1- GFP

ITEM	QUANTITY	NOTES
5-gallon stainless steel containers	As required	For unleaded fuel samples

ITEM	QUANTITY	NOTES
1-quart glass sample containers	As required	For oil samples
Paint Panels	As required	Paint Systems testing
Piper Synthetic Rubber Sheet	Fourteen (14)	FAA Supplied
Fairprene, Lycoming	Fourteen (14)	FAA Supplied
Piper Gaskets (462-049/462-056)	Twelve (12)	FAA Supplied
Piper Duckbill Check Valve	Six (6)	FAA Supplied

10.0 Other Direct Costs (ODCs)

As directed and authorized by the CO or COR, travel to support EAGLE or PAFI activities, shipping and disposal costs, as well as incidental nonrecurring items or services, may be reimbursed as Other Direct Costs. Travel expenses will be reimbursed in accordance with Federal Travel Regulations (www.gsa.gov), AMS contract cost principles for travel costs, contract terms and conditions, and AMS Clause 3.3.2-2 Reimbursement for Travel and Subsistence.

11.0 Shipping

The Contractor will be responsible for all fuel samples shipped until received at the final destination. Pre-approved shipping costs will be reimbursed as Other Direct Costs (ODC's) per paragraph 10.0. Shipping addresses are as follows:

Federal Aviation Administration
William J. Hughes Technical Center
Attn: Jeff Warner
ANG-E283 Bldg. 211,
Atlantic City, NJ, 08405

Dixie Services, Inc.
Attn: FAA WJHTC c/o Elyse Brady
1706 First Street
Galena Park, TX 77547

When required for the FAA WJHTC to ship items to the Contractor, the Contractor must provide a shipping address and POC.

12.0 References

The Contractor must comply with the requirements set forth in the latest version of the documents identified in Table 1, or any versions that supersede, unless notified in writing by the Contracting Officer (CO).

Table 2 - Reference Documents

NUMBER	TITLE
PAFI-MTP-002	PAFI Materials Test Plan (attached version)
n/a	PAFI Materials Test Matrix (attached version)
n/a	PAFI Materials Test Minimum Reporting and Format Requirements (attached version)
PAFI-RTP-001	PAFI Cold Flow Rig Test (attached version)
PAFI-RTP-004	PAFI Storage Stability Rig Test (attached version)
PAFI-RTP-005	PAFI Cold Storage Freezer Test (attached version)
PAFI-RTP-009	PAFI Dynamic Diaphragm Test (attached version)
PAFI-RTP-010	PAFI Sump Drain Valve Test (attached version)
14 CFR part 21	Certification Procedures for Products and Parts
n/a	PAFI Non-Disclosure Agreement (NDA)