

# Aviation Fuel Quality Assurance Requirements

Version 07/01/20



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## Training

Line service technicians shall receive training prior to performing unsupervised line service operations. Initial and recurrent training shall cover facility policies and procedures and include, but not be limited to, the content listed below:

### Misfueling Training ----- Annually

- NATA Safety 1<sup>st</sup> ([www.PreventMisfueling.com](http://www.PreventMisfueling.com))
  - General Aviation Misfueling Prevention (Online Training)
  - Operational Best Practices
- Energy Institute (EI) 1597
  - Aviation Misfueling Prevention (video)
  - Procedures for Overwing Fueling to Ensure Delivery of the Correct Fuel Grade to an Aircraft

### Review TrustedFuel.com ----- Annually

- Aviation Fuel Handling Guide
- Quality Assurance Obligations and Inspection Program
- Phillips 66 Quality Assurance Training Videos
  - White Bucket Test
  - API Gravity Test
  - Nozzle Screen Inspection
  - Free Water Test
  - Filter Membrane Test
  - Fuel System Icing Inhibitor (FSII) Concentration Test

### Online or Live Training (complete at least one) ----- 24 Months

- National Air Transportation Association (NATA) - Safety 1<sup>st</sup>
  - Online Training Center
  - Certified QC Inspector Workshop or similar program
- Aviation Continuing Education (ACE) – SafetyPro
  - Fuel Safety Supervisor (online)
  - Line Fuel Service (online)
- Fuel Safety Training meeting the FAA requirements (14 CFR Part 139.321)

## Records & Documentation

- Develop and maintain an operations manual covering facility policies and procedures
- Retain records to satisfy customers, suppliers, and applicable authority having jurisdiction; at a minimum, keep the following records at the FBO for at least 1 year or longer if noted below:
  - Training documentation
  - Receipt of Fuel:
    - Bill of Lading (BOL)
    - White bucket test results
    - Observed API gravity, observed temperature (°F), and corrected API gravity results (corrected API gravity must be within +/- 1° of the API gravity on the BOL)
    - Fuel System Icing Inhibitor (FSII) concentration results (must be within 0.10 to 0.15 volume %)
  - Filtration information (previous 3 years):
    - Element model numbers, date elements changed and next due date (one year after change date) (if separator element was cleaned and inspected per manufacturer to extend life - document procedure)
    - Differential pressure results
    - Similarity data sheets from filter manufacturer if elements have been updated from original elements installed in vessel
  - Daily, weekly, monthly, quarterly, and annual quality assurance checks
  - Equipment maintenance

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## Procedures

### Misfueling Prevention

- Follow NATA Safety 1<sup>st</sup> Misfueling prevention guidelines and operational best practices at [www.PreventMisfueling.com](http://www.PreventMisfueling.com)
- Follow EI 1597 “Procedures for Overwing Fueling to Ensure Delivery of the Correct Fuel Grade to an Aircraft”
- Implement “Save a Life – Verify Fuel Type” heart decals on refuelers and fueling dispensers (send email to [TrustedFuel@p66.com](mailto:TrustedFuel@p66.com) for free decals) +

### Receipt of Fuel

- Follow the Phillips 66 Aviation Fuel Handling Guide and use the Phillips 66 “Receipt of Fuel” or other industry approved form on all fuel deliveries (at a minimum - document white bucket results, observed API Gravity, observed temperature (°F), and corrected API gravity results must be within one degree of the API gravity on BOL)

### Filtration

- Verify with filter manufacturer that filters/elements are fit for purpose, correct for fuel type and latest edition
- Replace coalescer, particulate, and monitor elements if performance issues arise (e.g. differential pressure, free water test, filter membrane test); never exceed manufacturer’s 12-month service life
- Separator element life can be extended to 36 months if cleaned and inspected per manufacturer’s guidance, current edition, same category, and same manufacturer as the coalescer elements being installed (inspection records of separator need to be signed and retained with filtration records)
- Verify current filter element information (part numbers), date elements changed, and next due date is placarded on filter vessel or near filter vessel and is correct for fuel type and latest edition
- Fuel flow rate shall not exceed the rated capacity of the filtration system
- Filter element installation/commissioning shall follow filter manufacturer’s or other industry guidance

### Fuel Storage

- Manage fuel inventory so it does not exceed 6 months shelf life, or more than half of the product has been received during the previous 6-month period
- Defueled product shall not be sold as branded fuel and shall remain segregated

### Sampling & Testing

- Perform white bucket test to confirm fuel is free of particulate and water, and check for unfamiliar color or odor:
  - Storage tanks ..... *Daily*
  - Refueler tanks ..... *Daily*
  - Filter vessels or Relaxation chambers ..... *Daily*
  - Overwing nozzle samples ..... *Weekly*
- Perform FSII additive test (Jet A w/ FSII) ..... *Monthly +*

### Filtration

- Monitor differential pressure ..... *Daily*
- Confirm water defense system (float or probe) shuts down properly per manufacturer ..... *Quarterly*
- Perform Free Water Test (Jet A or Jet A w/ FSII) ..... *Monthly +*
- Perform Filter Membrane Test (Jet A or Jet A w/ FSII) ..... *Monthly +*

### Hoses & Nozzles

- Check hose condition ..... *Daily*
- Flush hose line fill if in sporadic or occasional use ..... *Weekly*
- Nozzle Screen: Inspect, clean, and replace per industry guidance:
  - Overwing ..... *Monthly*
  - Single Point ..... *Monthly \*\**

+ Recommended

\*\* If single point nozzle is used less than 8 times per month; inspection of nozzle screen can be extended to quarterly if nothing was found in the previous nozzle screen inspection

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## Equipment (Fixed & Mobile)

### Tanks and Piping

- Dedicated to a single type and grade of product
- Placarded properly per EI 1542:
  - Refueler: front, back, and both sides
  - Storage Tank: minimum two sides
- Fill points identified for grade of product:
  - Avgas 100LL: Painted blue or red with a blue band and labeled with product name
  - Jet A: Painted black and labeled with product name
  - Secure with different keyed padlock; label keys with Avgas 100LL or Jet A and store with appropriate test equipment (send email to TrustedFuel@p66.com for free Jet A and Avgas 100LL keychains) +
- Sump drain or sump pump required on tanks
- Copper or cadmium alloys, cadmium plating, galvanized steel or other zinc material coatings, and plastic materials are not permitted in fuel systems (stainless steel piping is recommended per EI 1540)

### Filtration

- Aviation approved particulate and water filtration required (latest edition):
  - Immediately upstream of the aircraft fueling dispenser (maximum 15' of 3" pipe or equivalent)
  - Into mobile fueling equipment
  - On mobile fueling equipment

Fuel Type	Coalescer/Separator (6th Edition) (Do not mix manufacturer's elements in the same vessel)	Monitor (7 <sup>th</sup> Edition)
Jet A with FSII	Category "M"	No
Jet A	Category "C" or "M"	Yes *
Avgas 100LL	Category "C" or "M"	Yes *

*\* Note: Monitor filtration containing super absorbent polymer (SAP) material is being phased out by the aviation industry. Please refer to the filter manufacturers for additional details on alternative filtration.*

- Placards on filter vessels or near filter vessel indicating:
  - Current element model numbers installed in vessel and they are the latest edition
  - Date elements were changed, and next due date shall be displayed (one year from change date)
- Water defense system (float or probe) required on coalescer/separator filtration located immediately upstream of aircraft fueling hose
- Sump drain required on filter vessels and relaxation chambers
- Differential pressure gauge required on filter vessels (recommend direct read type with peak hold)

### Dispensers, Hoses & Nozzles

- Dispensers properly placarded for grade per EI 1542
- Implement "Save a Life – Verify Fuel Type" heart decals on refuelers and fueling dispensers (send email to TrustedFuel@p66.com for free decals) +
- Aviation fueling hoses must be marked with EI 1529 or EI/API 1529 and in good condition; never exceed manufacturer's 10-year service life
- Overwing nozzle handles color coded per EI 1542:
  - Avgas 100 LL: Red Handle
  - Jet A: Black Handle
- Duckbill spouts required on jet overwing fueling nozzles per EI 1597
- Nozzle Screens (100 mesh) required on fueling nozzles
- Dust covers or other protective devices required on fueling nozzles

+ Recommended

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## FSII Additive Injection at the FBO (if applicable) \_\_\_\_\_

Develop and adhere to a Fuel System Icing Inhibitor (FSII) program that includes equipment, procedures, training and documentation specific to the injection and sale of Jet A with or without FSII including, but not limited to, the following:

- EI 1597 “Procedures for Overwing Fueling to Ensure Delivery of the Correct Fuel Grade to an Aircraft”
- NATA Safety 1st “General Aviation Misfueling Prevention”
- NATA Safety 1st “DEF Contamination Supplement”
- ASTM Manual 5 “Aviation Fuel Quality Control Procedures”

### Equipment & FSII Inventory

- Ensure FSII meets ASTM D4171 “Standard Specification for Fuel System Icing Inhibitor” and is stored and handled in accordance with manufacturer’s recommendations
- FSII containers (e.g. totes, drums, pails/tanks):
  - Prominently labeled to identify product
  - Charged desiccant filter on vent
- FSII additive injector system designed for aviation applications
- Graduated cylinder (minimum 500 ml) to test FSII injection rate using bypass test method
- FSII Additive Test Kit (B/2) to test jet fuel with FSII at storage tank or refueler
- Where FSII is not available, install and maintain “FSII not Available” decals on refuelers, fueling dispensers and fueling hoses to ensure proper identification of fuel type (send email to [TrustedFuel@p66.com](mailto:TrustedFuel@p66.com) for free decals)

### Procedures

- FSII injection systems and FSII containers:
  - Ensure FSII additive remains free from contaminants (e.g. water, dirt) and other products (e.g. Diesel Exhaust Fluid (DEF), TKS de-icing fluid)
  - Document all transfers of FSII additive to refuelers
  - Daily inspection of the components (e.g. tanks, lines, valves, desiccant filters) and correct deficiencies
  - Calibrate additive injectors per manufacturer’s guidance, at least monthly, to ensure a FSII additive concentration rate of 0.10 to 0.15 volume % (recommend 0.125)
- FSII additive injected into refueler or storage tank: confirm FSII additive concentration is within 0.10 to 0.15 volume % using a FSII Additive Test Kit (B/2)
- FSII additive injected at the aircraft wing: confirm fuel order with customers (Jet A with or without FSII) and document on fuel ticket
- FBO use of aerosol cans to dispense FSII additive into fuel is prohibited

## FSII Not Available at the FBO (if applicable) \_\_\_\_\_

Develop and adhere to a quality assurance program that includes equipment, procedures, training and documentation specific to sale of Jet A without FSII including, but not limited to, the following:

- EI 1597 “Procedures for Overwing Fueling to Ensure Delivery of the Correct Fuel Grade to an Aircraft”
- NATA Safety 1st “General Aviation Misfueling Prevention”

### Equipment

- Install and maintain “FSII not Available” decals on refuelers, fueling dispensers and fueling hoses to ensure proper identification of fuel type (send email to [TrustedFuel@p66.com](mailto:TrustedFuel@p66.com) for free decals)

### Procedures

- Confirm with customers that Jet A does not contain FSII additive and document on fuel ticket
- Communicate to the public that Jet A with FSII additive is not available (e.g. Ac-U-Kwik, AirNav, FBO website)
- FBO use of aerosol cans to dispense FSII additive into fuel is prohibited