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SUPERSEDING

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**DEPARTMENT OF DEFENSE
STANDARD PRACTICE**

**INTO - PLANE SERVICING OF FUELS
AT COMMERCIAL AIRPORTS**



AMSC N/A

FSC 91GP

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FORWARD

1. This standard is approved for use by all Departments and Agencies of the Department of Defense (DOD).

2. Comments, suggestions, or questions on this document should be addressed to HQ AFPET/PTOT, 2430 C Street, Bldg 70, Area B, Wright-Patterson AFB, OH 45433-7632 or e-mailed to AFPET.AFTH@wpafb.af.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <http://assist.daps.dla.mil>.

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1. SCOPE

1.1 Scope. This standard establishes two types of standard practices for into-plane servicing of fuels at commercial airports.

1.2 Classification. Classification of into-plane servicing is as follows:

Type I	Into-Plane Refueling Guidance per ATA Specification 103, Standard For Jet Fuel Quality Control at Airports.
Type II	Into-Plane Refueling Guidance as per IATA's Guidelines for Aviation Fuel Quality Control and Operating Procedures for Joint Into-Plane Fueling Services (JIG 1).

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this standard. This section does not include documents cited in other sections of this standard or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this standard, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-DTL-83413/4	Connectors and Assemblies, Electrical, Aircraft Grounding, Plugs, for Types I and II Grounding Assemblies.
MIL-DTL-83413/7	Connectors and Assemblies, Electrical, Aircraft Grounding: Grounding Clamp Connector for Types I and III Grounding Assemblies, Clip, Electrical
MIL-PRF-52308	Filter-Coalescer Element, Fluid Pressure

(Copies of these documents are available online at <http://assist.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Bldg 4D, Philadelphia, PA 19111-5094.)

2.3 Non-government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

AIR TRANSPORT ASSOCIATION (ATA)

ATA Specification 103	Standards for Jet Fuel Quality Control at Airports
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(Copies of these documents are available online at <http://www.air-transport.org> or from the Air Transport Association of America, 1301 Pennsylvania Ave. NW, Suite 1100, Washington, DC 20004.)

AMERICAN PETROLEUM INSTITUTE/ENERGY INSTITUTE (API/EI)

API/EI Specification 1581	Specifications and Qualification Procedures for Aviation Jet Fuel Filter/Separator (API/EI 1581)
API/EI Specification 1590	Specifications and Qualification Procedures for Aviation Fuel Microfilters (API/EI 1590)

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(Copies of these documents are available online at <http://www.api.org> or from the American Petroleum Institute, 1220 L Street, Northwest Washington DC, 20005-4070.)

ENERGY INSTITUTE (EI)

EI Specification 1583 Specifications and Qualification Procedures for Aviation Fuel Filter Monitors With Absorbent Type Elements (EI 1583)

(Copies of these documents are available online at <http://www.energyinst.org.uk/> or from Energy Institute 61 New Cavendish Street, London, W1G 7AR.)

ASTM INTERNATIONAL

ASTM D56 Standard Test Method for Flash Point by Tag Closed Cup Tester (DoD Adopted)

ASTM D93 Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester (DoD Adopted)

ASTM D1298 Standard Test Method for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method (DoD Adopted)

ASTM D1655 Standard Specification for Aviation Turbine Fuels (DoD Adopted)

ASTM D2276 Standard Test Method for Particulate Contaminant in Aviation Fuel by Line Sampling

ASTM D2624 Standard Test Methods for Electrical Conductivity of Aviation and Distillate Fuels (DoD Adopted)

ASTM D3241 Standard Test Method for Thermal Oxidation Stability of Aviation Turbine Fuels (JFTOT Procedure) (DoD Adopted)

ASTM D3828 Standard Test Methods for Flash Point by Small Scale Closed Cup Tester (DoD Adopted)

ASTM D4052 Standard Test Method for Density and Relative Density of Liquids by Digital Density Meter (DoD Adopted)

ASTM D5452 Standard Test Method for Particulate Contamination in Aviation Fuels by Laboratory Filtration (DoD Adopted)

(Copies of these documents are available online at <http://www.astm.org> or the ASTM International, 100 Barr Harbor Drive, West Conshohocken PA 19428-2959.)

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA)

IATA (JIG 1) Guidelines for Aviation Fuel Quality Control and Operating Procedures for Joint Into-Plane Fueling Services (JIG 1).

(Copies of these documents are available online at <http://www.iata.org> or from the International Air Transport Association Customer Svc, 800 Place Victoria, P.O. Box 113, Montreal Quebec, H4Z 1M1, Canada.)

NATIONAL FIRE PROTECTION ASSOCIATION

NFPA 407 Aircraft Fuel Servicing (DoD Adopted)

(Copies of these documents are available online <http://www.nfpa.org> or from the National Fire Protection Association, 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101.)

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SAE INTERNATIONAL

SAE AS5877

Detailed Specification for Aircraft Pressure Refueling Nozzle
(DoD Adopted)

(Copies of these documents are available online at <http://www.sae.org> or from SAE International, 400 Commonwealth Dr., Warrendale, PA USA 15096-0001.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. DEFINITIONS

3.1 Definitions applicable in this standard. The definitions for terms used in this standard are in accordance with ATA Specification 103 and the IATA Joint Into-plane Guidelines (JIG 1), with the following additional terms noted herein.

3.2 Full flow monitor cartridges. Fuse-type or fuel monitor elements, which remove free water and solid contaminants in the fuel. As the elements retain solids and water through absorption, fuel flow is restricted or shutoff.

4. GENERAL REQUIREMENTS

4.1 Type I and Type II. Receipt, storage, and issue of aviation products shall comply with ATA Specification 103 or IATA Joint Into-plane Guidelines (JIG 1) respectfully, except as noted herein.

4.1.1 Defueled product. Defueled product from other than U.S. Government aircraft shall not be used to refuel U.S. Government aircraft. Product defueled from U.S. Government aircraft may be returned to an authorized user and shall meet the defueled product quality criteria in Table I.

TABLE I. Defueled product quality criteria.

Property	Requirement	Test Method
Density at 15 °C (or API Gravity)	0.775-0.840 kg/L (37-51)	ASTM D1298 or D4052
Particulate contamination		
(1) Particulate content before filtration, or:	1.0 mg/L, max	ASTM D5452
(2) Particulate content after filtration into plane,	0.5 mg/L, max	ASTM D5452
or:		
(3) Color rating	A1,A2,B1,B2,G1, or G2	ASTM D2276
Conductivity		
Without conductivity additive	10 pS/m, max	ASTM D2624
With conductivity additive	50-700 pS/m	ASTM D2624
Water content (into plane)	15 ppmv, max	See JIG 1 or ATA 103
Appearance	Clear and Bright	Visual
Flash point ¹	38 °C (100 °F), min	ASTM D56, D93, or D3828
Notes:		
1. ASTM D56 may give results up to 1°C (2°F) below the ASTM D93 results. ASTM D3828 may give results up to 1.7°C (3°F) below the ASTM D93 results.		

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4.1.1.1 Defueled JP8+100 product. Aircraft containing JP-8+100 shall not be defueled unless an imminent emergency exists. The aircraft home station, applicable military Service Control Point (SCP), or Major Command shall be contacted regarding disposition instructions. JP-8+100 product can only be returned to the aircraft from which it was defueled.

4.1.2 Safety. Safety requirements as specified in NFPA 407 shall apply to Type I.

5 DETAILED REQUIREMENTS

5.1 Type I. Type I refueling at commercial airports shall be performed as specified in ATA Specification 103, except as noted herein.

5.1.1 Jet fuel specification and purity standards. The requirements of ATA Specification 103 shall apply except for the following.

5.1.1.1 Additive injection. There may be a requirement to add additives to the fuel. The additives are Fuel System Icing Inhibitor (FSII) or Static Dissipator Additive (SDA). The only authorized FSII for Department of Defense aircraft is diethylene glycol monomethyl ether. The following additive blending guidance is provided in order to assure proportional injection of the additives. The two basic methods for adding additives into fuel are manual blending and use of an injector.

a. The preferred method is proportional injection using a fuel driven design injector. This type injects additives proportionately at various flow rates.

b. Manually blending additives at various points in the system can be accomplished by several techniques, some of which are described below. When manual blending is performed, additive should first be diluted with the fuel. The greater the dilution, the easier it is for the additive to mix properly. Fuel additives should not be mixed together in neat form as a cocktail blend for injecting into fuel.

1. Blending additives into bulk airfield tanks can be done by pouring the required quantity of additive into the tank heel followed by a receipt. Care should be taken when manually introducing additive to tank heels to avoid over/under additizing resulting from variations in anticipated vs. actual quantities received. The required quantity of additive may also be added to the delivery tank trucks just prior to offloading into bulk tanks.

2. Blending into refueling units can be performed by introducing the required amount through the top hatch using a funnel and a length of hose with one end submerged below the surface of the fuel. This can best be accomplished by pouring the additive into the refueler, filled to not more than one-third of its capacity and then filling the unit with fuel. Wait approximately 10 minutes and then circulate fuel for at least three minutes before servicing to aircraft. If additives are put into a full refueler, circulate at least 150 percent of the refueler capacity prior to issue.

c. When required, fuel system icing inhibitor (FSII) may be added using the 590 mL (20 ounce) aerosol can during over-wing refueling. Determine the fuel load and calculate the amount of additive required. It should be added gradually during filling to permit proper blending in the fuel. One can of aerosol additive will inhibit 680 liters (180 gallons) of fuel to 0.087% by volume.

d. When FSII and/or static dissipator additive (SDA) is injected into fuel the following concentration levels apply: Fuel injected with FSII shall contain 0.07 – 0.20 vol. % FSII content; if the fuel is injected with SDA, the SDA content shall be between 50 and 700 conductivity units (CU).

5.1.2 Hydrant system checks. The requirements of ATA Specification 103 shall apply, except that for any modifications, changes, or construction work to hydrant systems, the contractor shall also notify the contracting officer.

5.1.3 Aircraft fueling equipment requirements. The requirements of ATA Specification 103 shall apply, except for electrostatic bonding, the following specific equipment shall be required.

5.1.3.1 Electrostatic Bonding.

5.1.3.1.1 Grounding plug. When the aircraft being serviced is equipped with grounding receptacles, a grounding plug conforming to or equivalent in design to MIL-DTL-83413/4 shall be used.

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5.1.3.1.2 Grounding clamp. When the aircraft being serviced is not equipped with grounding receptacles or a plug is not available, a grounding clamp conforming to or equivalent in design to MIL-DTL-83413/7 shall be used on the bonding cables of the refueling equipment. When a grounding clamp is used, it shall be connected to a bare metal surface of the aircraft. Do not secure/attach to external doors, latches or hinges.

5.1.3.2 Aircraft Pressure Refueling Nozzle. Aircraft pressure refueling nozzles shall meet the requirements of SAE AS5877.

5.2 Type II. Type II Refueling at Commercial Airports shall be performed as specified in the IATA Joint Into-plane Guidelines (JIG 1), except as noted herein.

5.2.1 Jet fuel specifications. The IATA guide specification, ASTM D1655, or applicable specification cited in the contract, shall be used with the following additional requirements.

5.2.1.1 Additive injection. When additives are required, see paragraph 5.1.1.1.

5.2.2 Maintenance and testing of fueling equipment. The requirements in the IATA Joint Into-plane Guidelines (JIG 1) apply with the following exceptions.

5.2.2.1 Bonding wires. When testing for continuity, use either of the following methods.

- a. Continuity tester N22T (Ray-O-Vac) or equivalent.
- b. Simpson Model 260, Volt ohm Meter or equivalent. When using this type test equipment the resistance shall be 25 ohms or less.

5.2.2.2 Storage tanks. Storage tanks shall be inspected and cleaned as necessary whenever tank samples show a continuous solids build-up or when filtration elements on the downstream side of tanks show evidence of premature plugging from excessive solids.

5.2.3 Fueling operations. The requirements of the IATA Joint Into-plane Guidelines (JIG 1) apply in their entirety with exceptions noted herein.

5.2.3.1 Electrostatic Bonding.

5.2.3.1.1 Grounding plug. When the aircraft being serviced is equipped with a grounding receptacle, a grounding plug conforming to or equivalent in design to MIL-DTL-83413/4 shall be used.

5.2.3.1.2 Grounding clamp. When the aircraft being serviced is not equipped with grounding receptacles or a plug is not available, a grounding clamp conforming to or equivalent in design to MIL-DTL-83413/7 shall be used on the bonding cables of the refueling equipment. When a grounding clamp is used, it shall be connected to a bare metal surface of the aircraft. Do not secure/attach to external doors, latches or hinges.

5.2.3.2 Aircraft Pressure Refueling Nozzle. Aircraft pressure refueling nozzles shall meet the requirements of SAE AS5877.

5.2.4 Filtration equipment. The filtration equipment requirements in the IATA Joint Into-plane Guidelines (JIG 1) apply in their entirety with exceptions noted.

5.2.4.1 Filtration requirements. All aviation fuel shall pass through two filters. One filter shall be at the inlet to the operating tank and one filter shall be on the fueller-loading rack or hydrant delivery lines. The initial filter must be a filter separator. The final filtration of jet fuel shall be through a filter separator or a full flow monitor. One of the two filters used for aviation gasoline shall be a filter separator or fuel monitor. The filter separator referred to for both products shall meet the requirement of API/EI 1581 or MIL-PRF-52308. The full-flow monitor shall meet the requirements of E11583. The micron filter shall meet the requirement of API /EI1590. Filtration equipment shall be designed so that fuel bypass is not possible.

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6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The purpose of this standard is to ensure government aircraft are provided specification fuel at commercial facilities where a US Government Into-Plane Servicing Contract is in force. The JP-8+100 defueling procedures covered by this standard are unique as only DoD aircraft use JP-8+100. Defueling of JP-8+100 at commercial airports must only be accomplished under emergency situations after coordination with the aircraft's home station, military Service Control Point, of Major Air Command and must be handled appropriately to avoid contaminating systems not capable of handling the JP-8+100. Additive injection procedures mentioned in this standard are also military unique as the additive package required in fuel used by DoD aircraft is not used in commercial fuels - the additive package required in fuel destined for DoD aircraft is required as it provides additional safeguards against fuel system icing and fuel system static charges.

6.2 Acquisition requirements. Acquisition documents should specify the title, number, and date of this standard.

6.3 Publications. The JIG 1 publication referred to in Type II of the detailed requirements is available through two sources. It is prepared by and for members of the Joint Inspection Group, participants of the JIG can obtain the document through corporate channels. The JIG guidance referred to in Type II has also been written into the International Air Transport Association (IATA) Joint Into-Plane Guidance Material for Aviation Turbine Fuels Quality Control and Operating Procedures, 1st Edition. It is identical to the JIG used by JIG participants. The 1st Edition of the IATA publication can be procured from IATA Customer Svc, 800 Place Victoria, P.O. Box 113, Montreal Quebec, Canada, H4Z 1M1, Fax (514) 874-9659.

6.4 Subject term (key word) listing.

Aviation Gasoline
JP8+100 product
Defueled product
Aircraft pressure refueling nozzle

6.5 Quality assurance requirements. Quality assurance requirements imposed as part of any contract may include sample submission to one of the laboratories listed in Table II or Table III of this standard.

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TABLE II. Laboratories within the continental United States.

Mailing Address	Shipping Address	Telephone Numbers	FAX Numbers	Area of Responsibility
HQ AFPET/PTPLA Bldg 70, STE 01 2430 C St, Area B WPAFB OH 45433-7632	HQ AFPET/PTPLA Bldg 70, STE 01 2430 C St, Area B WPAFB OH 45433-7632	DSN 785-0739 COM (937) 255-0739	DSN 986-7744 COM (937)656-7744	AL, AR, CT, DC, DE, FL, GA, IA, IL, IN, KS, KY, LA, MA, MD, ME, MI, MN, MO, MS, NC, NE, NH, NJ, NY, OH, OK, PA, RI, SC, SD, TN, TX, VA, VT, WI, WV
HQ AFPET/PTPLE 1747 Utah Ave, Bldg 6670 Vandenberg AFB CA 93437-5220	HQ AFPET/PTPLE 1747 Utah Ave, Bldg 6670 Vandenberg AFB CA 93437-5220	DSN 276-6263 COM (805) 606-6263	DSN 276-2756 COM (805) 606-2756	AZ, CA, CO, ID, MT, ND, NM, NV, OR, UT, WA, & WY
Army Petroleum Center ATTN: AMSTA-LC-CJPT U Avenue, Bldg 85-3 New Cumberland, PA 17070-5005	Army Petroleum Center ATTN: AMSTA-LC -CJPT U Avenue, Bldg 85-3 New Cumberland, PA 17070-5005	DSN 771-6511 COM (717) 770-6511	DSN 771-4743 COM (717) 770-4743	All States

6.6 Changes from previous issue. The margins of this standard are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

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TABLE III. Laboratories outside the continental United States.

Mailing Address	Local Shipping Address	Telephone Numbers	Fax Numbers
HQ AFPET/PTPLF Unit 5025 Box 495 APO AE 09459-5025	HQ AFPET/PTPLF RAF Mildenhall, Bldg 725 Bury ST Edmunds Suffolk, England IP28 8NF	DSN 314-238-2043 COM 44-1-638-542043	DSN 314-238-3626 COM 44-1-638-543626
HQ AFPET/PTPLG Unit 5161 APO AP 96368-5161	HQ AFPET/PTPLG Bldg 854 Kadena, AB Okinawa, Japan 96368-5161	DSN 315-634-3394/1602 COM 611-734-3394	DSN 315-634-0584
505th QM Battalion APAJ-GO-QL Unit 35130 APO AP 96376-5130	505th QM Bn Petrol Lab Attn: APAJ-GO-QL Unit 35130 Kadena AFB, Okinawa	DSN 315-632-4058 COM 81-6117-324058	DSN 315-634-1376 COM 81-6117-34137693043
Code 704, FISC Yokosuka Hakozaki Fuel Department PSC 473, Box 11 FPO AP 96349-0011	FISC Tsurumi Hakozaki Laboratory PSC 471 FPO AP 9634 7-2000	DSN 244-2733 COM 81-311-734-2733	COM 81-311-734-7050
FISC Pearl Harbor POL Lab Code 704 1942 Gaffney St, Suite 100 Pearl Harbor HI 96860-4549	FISC Pearl Harbor POL Laboratory 300 Neches Avenue Bldg 1685, Code 704 Pearl Harbor, HI 96860	DSN 315-473-7989 COM (808) 473-7989	DSN 315-473-7981 COM (808) 473-17981
FISC Yokosuka, Fuel Department Sasebo Fuel Division Laboratory Branch Code 702.3, PSC 476, Box 6 FPO AP 96322-1504	FISC Yokosuka DetSasebo POL Laboratory PSC 476, Box 7 FPO AP 96322-1504	DSN 315-252-4134 COM 81-956-24-6111 Ext 4134	DSN 252-4139 COM 81-956-24-0968 Ext 4137
DEO-A Attn: Laboratory 6-920 12th Street Elmendorf AFB AK 99506	Fuels Laboratory Bldg 986 Ft Richardson AK 99505	DSN 317-384-7180 COM (907) 384-7180	DSN 317-384-2447 COM (907) 384-2447
DESC Europe Petroleum Laboratory CMR 422 APO AE 09067	DLA/DESC Europe Pet Lab Rhein Ordnance Barracks Bldg 320 AM Opelkreisel 67663 Kaiserslautern, Germany	DSN 314-493-2286/4/8 COM 49-631-3406-2286/4/8	DSN 314-493-2289 COM 49-631-3406-2289
379 th ELRS/AFPET HQ AFPET/PTPLI VAPO AE 09309 QATAR	379th ELRS/AFPET HQ AFPET/PTPLI APO AE 09309 QATAR	DSN 318-437-2696	

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CONCLUDING MATERIAL

Custodians:

Army – AV
Navy – AS
Air Force – 68
DLA – PS

Preparing activity:

Air Force – 68
(Project 91GP-2008-002)

Review activities:

Army – CD
Navy – SA
DLA – CC

Note: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <http://assist.daps.dla.mil> .