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DEPARTMENT OF DEFENSE
STANDARD PRACTICE
INTO-PLANE SERVICING OF FUELS
AT COMMERCIAL AIRPORTS



AMSC

FSC 91GP

Distribution Statement A. Approved for public release; distribution is unlimited.

FOREWORD

INTO-PLANE SERVICING OF FUELS AT COMMERCIAL AIRPORTS

1. This Standard is approved for use by all Departments and Agencies of the Department of Defense.
2. This standard has been substantially revised in both content and format to align itself with the Air Transport Association Specification 103, Standards For Jet Fuel Quality Control At Airports, and with Guidelines For Aviation Fuel Quality Control And Operating Procedures For Joint Into-Plane Fueling Services (JIG). This is in accordance with DoD policy to utilize to the maximum degree possible those non-Government standards that satisfy the needs of the military. This standard augments these commercial standards with additional DoD requirements, which the standards do not address (see 6.1).
3. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: SA-ALC/SFTT, 1014 Billy Mitchell Blvd., Bldg 1621, Suite 1, Kelly AFB TX 78241-5603 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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1. SCOPE

1.1 Scope. This standard establishes 2 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). |

2. APPLICABLE DOCUMENTS

2.1 General. The documents specified in this section are specified in sections 3, 4, and 5 of the 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 documents cited in section 3, 4, and 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 listed in the current issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitations.

STANDARDS

DEPARTMENT OF DEFENSE

- | | |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| MIL-C-83413/4 | Connector and Assemblies, Electrical, Aircraft Grounding, Plugs, for Types I and II Grounding Assemblies |
| MIL-C-83413/7 | Connector and Assemblies, Electrical, Aircraft Grounding: Grounding Clamp Connector for Types I and III Grounding Assemblies, Clip, Electrical |

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Order Desk, 700 Robbins Avenue, Building 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 the documents that are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AIR TRANSPORT ASSOCIATION

- ATA Specification 103 Standards for Jet Fuel Quality Control at Airports

(Application for copies should be addressed to the Air Transport Association of America, 1709 New York Ave. N.W., Washington D.C. 20006)

INTERNATIONAL AIR TRANSPORT ASSOCIATION

IATA (JIG)

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

(Application for copies should be addressed to the International Air Transport Association Customer Svc, 800 Place Victoria, P.O. Box 113, Montreal Quebec, Canada, H4Z 1M1)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D2276 (DoD Adopted)

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

ASTM D5452 (DoD Adopted)

Standard Test Method for Particulate Contamination in Aviation
Fuels by Laboratory Filtration

(Application for copies should be addressed to ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959)

NATIONAL FIRE PROTECTION ASSOCIATION

NFPA 407

Aircraft Fuel Servicing

(Application for copies should be addressed to the National Fire Protection Association, 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, 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), 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. Refueling at commercial airports shall be performed as specified in ATA Specification 103 or IATA Joint Into-plane Guidelines (JIG) 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 D 1298 or D 4052
Particulate contamination		
(1) Particulate content before filtration, or:	1.0 mg/L, max.	ASTM D 5452
(2) Particulate content after filtration into plane,	0.5 mg/L, max.	ASTM D 5452
or:		
(3) Color rating	A1, A2, B1,B2 G1, or G2	ASTM D 2276
Conductivity		
No conductivity additive present, or	10 pS/m, max	ASTM D 2624
With conductivity additive	50-450 pS/m	ASTM D 2624
Water content into plane	15 ppm, max	See JIG or ATA 103
Appearance	Clear and Bright	Visual
Flash point	38 °C (100 °F)	ASTM D 56, D 93, or D 3828

4.1.1.1 Defueled JP8+100 product. Aircraft containing JP-8+100 shall not be defueled into fuel servicing equipment unless the servicing equipment is equipped with water absorption media filter elements or API 1581, 4th Edition, M100 category filter elements. JP8+100 product can only be returned to the aircraft from which it was defueled. If the facility can not handle the JP-8+100 defuel, the aircrew shall be advised.

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 Thermal stability property. The test temperature for the thermal stability test, ASTM D 3241, shall be 260°C only.

5.1.1.2. Additive injection. If there is a requirement to add additives to the aviation fuel, 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 hand doping and use of a proportional injector.

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

b. Hand doping additives at various points in the system can be accomplished by several techniques, some of which are described below. When hand doping is performed, additive should first be diluted with the fuel. The greater the dilution, the easier it is for the additive to be mixed 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 receipt. Care should be taken when hand doping tank heels to avoid over/under additizing that may result if the anticipated receipt unexpectedly varies in quantity or fuel received has already been additized. The required quantity of additive may also be added to 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 SDA is injected into fuel the following concentration levels apply: Fuel injected with FSII shall contain .07 - .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 Grounding plug. When the aircraft being serviced is equipped with grounding receptacles, a grounding plug conforming to or equivalent in design to MIL-C-83413/4 shall be used.

5.1.3.2 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-C-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.

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

5.2.1 Jet fuel specifications. The IATA guide specification, ASTM D 1655, or applicable specification cited in the contract, shall be used with the following additional requirements.

5.2.1.1 Thermal stability properties. The test temperature for the thermal stability test, ASTM D 3241, shall be 260°C only.

5.2.1.2 Additive injection. When additives are required see 5.1.1.2.

5.2.2 Maintenance and testing of fueling equipment. The requirements in the IATA Joint Into-plane Guidelines (JIG) 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 10 ohms or less.

5.2.2.2 Storage tanks. Storage tanks shall be inspected and cleaned as necessary when 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) apply in their entirety with exceptions noted herein.

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

5.2.3.2 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-C-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.

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

5.2.4.1 Filtration requirements. All aviation fuel shall pass through two filters. One at inlet to the operating tank and one on the fueler loading rack or hydrant delivery lines. The initial filter may be a filter separator, micronic filter, or full-flow monitor cartridge type device. 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 shall meet the requirement of API 1581 or MIL-PRF-52308. Filtration equipment shall be designed so that fuel bypass is not possible.

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. Defuels of JP-8+100 at commercial airports must be handled appropriately to avoid contaminating systems not capable of handling the JP-8+100. The requirement in this standard to perform thermal stability tests at 260 °C only is also military unique as DoD aircraft require fuel with an improved thermal margin to reduce problems associated with engine coking. 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 Issue of DoDISS. When this standard is used in acquisition, the applicable issue of the DoDISS must be cited in the solicitation (see 2.2.1 and 2.3).

6.3 Subject term (key word) listing.

Aviation Gasoline
 Commercial Jet Fuels
 Jet Fuels
 Refueling at Commercial Airports

6.4 Publications. The JIG 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.)

6.5 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.

TABLE II. Laboratories Within the Continental United States.

Mailing Address	Shipping Address	Telephone Numbers	FAX Numbers	Area of Responsibility
Det 13, SA-ALC/SFTLA Bldg 70, STE 01 2430 C St WPAFB OH 45433-7632	Det 13,SA-ALC/SFTLA Bldg 70, STE 01 2430 C St WPAFB OH 45433-7632	DSN 785-2106 COM (937)255-2106	DSN 986-7744 COM (937)656-7744	IA, IL, IN, KS, MI, MN, NE, OH, OK, SD, TX & WI
Det 20, SA-ALC/SFTLB P.O. Box 408 Searsport ME 04974-0408	Det 20,SA-ALC/SFTLB Trundy Rd, Bldg 14 Searsport ME 04974-0408	COM (207)548-2451	COM (207)548-0351	CT, DC, DE, KY, MA, MD ME, MO, NC, NH, NJ, NY, PA, RI, TN, VA, VT & WV
Det 21, SA-ALC/SFTLC P.O. Box 6051 MacDill AFB FL 33621-0051	Det 21,SA-ALC/SFTLC 5311 N Boundry Rd, Bldg 1121 MacDill AFB FL 33621-5005	DSN 968-3645 COM (813)828-3645	DSN 968-6706 COM (813)828-6706	AL, AR, FL, GA, LA, MS, & SC
Det 35, SA-ALC/SFTLD 10 Park Ave C, Bldg 1 Mukilteo WA 98275-1618	Det 35,SA-ALC/SFTLD 10 Park Ave C, Bldg 1 Mukilteo WA 98275-1618	DSN 984-5318 COM (425)355-4122	COM (425)348-6719	AZ, CA, CO, ID, MT, ND, NM, NV, OR, UT, WA & WY

TABLE III. Laboratories Outside the Continental United States.

Mailing Address	Local Shipping Address	Telephone Numbers	Fax Numbers
OL SA-ALC/SFTLF Unit 5025 Box 495 APO AE 09459-5025	OL SA-ALC/SFTLF 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
OL SA-ALC/SFTLJ Unit 6106 APO AE 09604-6106	OL SA-ALC/SFTLJ Bldg 1048, Area F Aviano AB 33081 Aviano (PN) Italy	DSN 314-632-7550 COM 39-0434-667550	DSN 314-632-8865 COM 39-0434-668865
Det 44, SA-ALC/SFTLJG Aerospace Fuels Lab Unit 5161 APO AP 96368-5161	Det 44, SA-ALC/SFTLJG 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
FISC Tsurumi Hakozaki Laboratory PSC 471 FPO AP 96347-2000	FISC Tsurumi Hakozaki Laboratory PSC 471 FPO AP 96347-2000	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 Code 704 Bldg 1685, Neches Ave. Pearl Harbor HI 96860-4549	DSN 315-473-0239 COM (808)473-0239	DSN 315-473-1566 COM (808)473-1566
FISC Yokosuka, Det Sasebo Code 184 POL Laboratory PSC 476, Box 7 FPO AP 96322-1504	FISC Yokosuka, Det Sasebo 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
DLA/DESC Europe Pet. Lab Unit 23135 APO AE 09227	DLA/DESC Europe Pet. Lab Rhein Ordnance Barracks Bldg 320 Am Opelkreis 67663 Kaiserslautern, Germany	DSN 314-489-7326 COM 49-631-536-7326	DSN 314-489-7084 COM 49-6331-536-7084

6.6 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

CONCLUDING MATERIAL

Custodian:

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

Preparing activity:

Air Force - 68

Review activities:

Army - CD
Navy - SA
DLA - CC

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