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DEPARTMENT OF DEFENSE STANDARD PRACTICE

INTO-PLANE SERVICING OF FUELS
AT COMMERCIAL AIRPORTS



AMSC N/A FSC 91GP

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 (DoD).
- 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 (see paragraph 6.1).
- 3. Comments, suggestions, or questions on this document should be addressed to Technical Assistance Branch ATTN: Det 3, WR-ALC/AFTH, 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://www.dodssp.daps.mil or http://assist1.daps.dla.mil/quicksearch.

CONTENTS

PARAG	<u>RAPH</u>	<u>PAGE</u>
	FOREWARD	ii
1	SCOPE	1
1.1	Scope	
1.2	Classification	
	A DRIVING A DATE DO CAR ATENTES	4
2	APPLICABLE DOCUMENTS	
2.1 2.2	General	
2.2.1	Government documents	
2.2.1		
2.3	Non-Government publications Order of precedence	3
2.4	Order of precedence	
3	<u>DEFINITIONS</u>	
3.1	Definitions applicable in this standard	
3.2	Full flow monitor cartridges.	3
4	GENERAL REQUIREMENTS	3
4.1	Type I and Type II	
4.1.1	Defueled product	
4.1.1.1	Defueled JP-8+100 product	
4.1.2	Safety	4
5	DETAILED REQUIREMENTS	1
5 5.1	Type I	
5.1.1	Jet fuel specification and purity standards	
5.1.1.1	Additive injection	
5.1.2	Hydrant system checks	
5.1.3	Aircraft fueling equipment requirements	4
5.1.3.1	Electrostatic bonding.	4
5.1.3.1.1		
5.1.3.1.2		
5.1.3.2	Aircraft pressure refueling nozzle	
5.2	Type II	5
5.2.1	Jet fuel specifications	5
5.2.1.1	Additive injection	
5.2.2	Maintenance and testing of fueling equipment	
5.2.2.1	Bonding wires	5
5.2.2.2	Storage tanks	
5.2.3	Fueling operations	
5.2.3.1	Electrostatic bonding	
5.2.3.1.1	\mathcal{C}_1	
5.2.3.1.2		5
5.2.3.2	Aircraft pressure refueling nozzle	
5.2.4	Filtration equipment	
5.2.4.1	Filtration requirements	3
6	<u>NOTES</u>	
6.1	Intended use	
6.2	Acquisition requirements	
6.3	Publications	
6.4	Subject term (key word) listing	6

CONTENTS

<u>PARAGRAPH</u>	<u> 1</u>	PAGE
6.5	Quality assurance requirements	6
6.6	Changes from previous issue	8

LIST OF TABLES

TABLE	<u>S</u>	PAGI
I	Defueled product quality criteria	3
	Laboratories within the continental United States	
III	Laboratories outside the continental United States	7
CONCI	LUDING MATERIAL	8

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1. SCOPE

- 1.1 <u>Scope</u>. This standard establishes two types of standard practices for into-plane servicing of fuels at commercial airports.
 - 1.2 <u>Classification</u>. 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 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 <u>Specifications, standards, and handbooks.</u> 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 STANDARDS

MIL-C-83413/4	Connector and Assemblies, Electrical, Aircraft Grounding, Plugs, for Type I and Type 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
MIL-PRF-52308	Performance Specification, Filter-Coalescer Element, Fluid Pressure

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094 or online at http://assist1.daps.dla.mil/quicksearch or www.dodssp.daps.mil.)

2.3 <u>Non-Government publications</u>. 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 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)

AMERICAN PETROLEUM INSTITUTE/INSTITUTE OF PETROLEUM

API/IP Specification 1581 Specifications and Qualification Procedures for Aviation Jet Fuel

Filter/Separators

API/IP Specification 1583 Specification and Qualification Procedures for Aviation Fuel Filter

Monitors With Absorbent Type Elements

(Application for copies should be addressed to American Petroleum Institute 1220 L Street, NW Washington, DC 20005-4070 or to order online at www.api.org.)

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

Adopted)

ASTM D93 Standard Test Method 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 (DoD Adopted)

ASTM D2624 Standard Test Method 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 Method for Flash Point by Small Scale Closed 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)

(Application for copies should be addressed to ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or online at http://www.astm.org.)

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.)

SOCIETY OF AUTOMOTIVE ENGINEERS

SAE AS5877

Detailed Specification for Aircraft Pressure Refueling Nozzle

(Application for copies should be addressed to the Society of Automotive Engineers, 400 Commonwealth Dr., Warrendale, PA USA 15096-0001 or online at http://www.sae.org.)

2.4 <u>Order of precedence.</u> 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 <u>Definitions applicable in this standard.</u> 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 <u>Full flow monitor cartridges</u>. 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 <u>Type I and Type II.</u> Receipt, storage, and issue of aviation products shall comply with ATA Specification 103 or IATA Joint Into-plane Guidelines (JIG) respectfully, except as noted herein.
- 4.1.1 <u>Defueled product.</u> 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, GI or G2	ASTM D 2276
Conductivity		
Without conductivity additive	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 <u>Defueled JP8+100 product</u>. 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, 5th Edition, M100 category filter elements. JP8+100 product can only be returned to the aircraft from which it was defueled. If the facility cannot handle the JP-8+100 defuel requirements, 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 <u>Type I</u>. Type I refueling at Commercial Airports shall be performed as specified in ATA Specification 103, except as noted herein.
- 5.1.1 <u>Jet fuel specification and purity standards</u>. The requirements of ATA Specification 103 shall apply except for the following.
- 5.1.1.1 <u>Additive injection.</u> 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.
- b. When required, fuel system icing inhibitor (FSII) may be added using the 590 mL (20 ounce) aerosol can during overwing 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 inhibits 680 liters (180 gallons) of fuel to 0.087% by volume.
- c. 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 <u>Hydrant system checks.</u> 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 <u>Aircraft fueling equipment requirements</u>. The requirements of ATA Specification 103 shall apply in their entirety with exceptions noted herein.
- 5.1.3.1 Electrostatic bonding.
- 5.1.3.1.1 <u>Grounding plug</u>. When the aircraft being serviced is equipped with a grounding receptacle, the use of a grounding plug is preferred. The only grounding plug that shall be used with a grounding receptacle must conform to or be equivalent in design to MIL-C-83413/4.
- 5.1.3.1.2 <u>Grounding clamp</u>. 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.
- 5.1.3.2 <u>Aircraft pressure refueling nozzle</u>. Aircraft pressure refueling nozzles shall meet the requirements of SAE AS5877.

- 5.2 <u>Type II</u>. 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 <u>Jet fuel specifications.</u> 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 Additive injection. When additives are required, see paragraph 5.1.1.1.
- 5.2.2 <u>Maintenance and testing of fueling equipment.</u> The requirements in the IATA Joint Into-plane Guidelines (JIG) apply with the following exceptions.
- 5.2.2.1 <u>Bonding wires.</u> 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 <u>Storage tanks</u>. 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 <u>Fueling operations</u>. The requirements of the IATA Joint Into-plane Guidelines (JIG) apply in their entirety with exceptions noted herein.
- 5.2.3.1 Electrostatic bonding.
- 5.2.3.1.1 <u>Grounding plug.</u> When the aircraft being serviced is equipped with a grounding receptacle, the use of a grounding plug is preferred. The only grounding plug that shall be used with a grounding receptacle must conform to or be equivalent in design to MIL-C-83413/4.
- 5.2.3.1.2 <u>Grounding clamp</u>. 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.
- 5.2.3.2 <u>Aircraft pressure refueling nozzle</u>. Aircraft pressure refueling nozzles shall meet the requirements of SAE AS5877.
- 5.2.4 <u>Filtration equipment</u>. 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 filter shall be at the inlet to the operating tank and one filter shall be 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, and fuel monitors will meet the API 1583 requirements. 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 <u>Intended use.</u> 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. Defuelings of JP-8+100 at commercial airports 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 <u>Publications</u>. 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.

6.4 Subject term (key word) listing.

Aviation gasoline Commercial jet fuels Jet fuels Refueling at commercial airports

6.5 <u>Quality assurance requirements</u>. 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 3, WR-ALC/AFTLA 2430 C ST, BLDG 70, AREA B, WPAFB, OH 45433-7632	2430 C ST_BLDG 70	DSN 785-8116 COM (937) 255-8116	DSN 785-8088 COM (937)255-8088	AL, AR, FL, GA, IA, IL, IN, KS, LA, MI, MN, MS, NE, ND, OH, OK, SC, SD, TX, & WI
Det 3, WR-ALC/AFTLB P.O. Box 408 Searsport ME 04974-0408	Det 3, WR-ALC/AFTLB 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 3, WR-ALC/AFTLE 1747 Utah Ave., Bldg 6670 Vandenberg AFB CA 93437-5220	Det 3, WR-ALC/AFTLE 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-CJPTU 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

TABLE III. Laboratories outside the continental United States.

Mailing Address	Local Shipping Address	Telephone Numbers	Fax Numbers
Det 3, WR-ALC/AFTLF	Det 3, WR-ALC/AFTLF	DSN	DSN
Unit 5025	RAF Mildenhall, Bldg 725	314-238-2043	314-238-3626
Box 495	Bury ST Edmunds	COM	COM
APO AE 09459-5025	Suffolk, England IP28 8NF	44-1-638-542043	44-1-638-543626
Det 3, WR-ALC/AFTLG	Det 3, WR-ALC/AFTLG	DSN	DSN
Aerospace Fuels Lab	Bldg 854	315-634-3394/1602	315-634-0584
Unit 5161	Kadena, AB	COM	
APO AP 96368-5161	Okinawa, Japan 96368-5161	611-734-3394	
505th QM Battalion	505th QM Bn Petrol Lab	DSN	DSN
APAJ-GO-QL	Attn: APAJ-GO-QL	315-632-4058	315-634-1376
Unit 35130	Unit 35130	COM	COM
APO AP 96376-5130	Kadena AFB, Okinawa	81-6117-324058	81-6117-34137693043
Code 704, FISC Yokosuka	FISC Tsurumi	DSN	COM
Hakozaki Fuel Department	Hakozaki Laboratory	244-2733	81-311-734-7050
PSC 473, Box 11	PSC 471	COM	
FPO AP 96349-0011	FPO AP 96347-2000	81-311-734-2733	
FISC Pearl Harbor	FISC Pearl Harbor	DSN	DSN
POL Lab Code 704	POL Laboratory Code 704	315-473-0239	315-473-1566
1942 Gaffney St, Suite 100	Bldg 1685, Neches Ave.	COM	COM
Pearl Harbor HI 96860-4549	Pearl Harbor HI 96860-4549	(808) 473-0239	(808) 473-1566
FISC Yokosuka, Fuel	FISC Yokosuka Det	DSN	DSN
Department	POL Laboratory	315-252-4134	252-4139
Sasebo Fuel Division	PSC 476, Box 7	COM	COM
Laboratory Branch	FPO AP 96322-1504	81-956-24-6111	81-956-24-0968
Code 702.3, PSC 476, Box 6		Ext 4134	Ext 4137
FPO AP 96322-1504			
DEO-A	Fuels Laboratory	DSN	DSN
Attn: Laboratory	Bldg 986	317-384-7180	317-384-2447
6-920 12th Street	Ft Richardson AK 99505	COM	COM
Elmendorf AFB AK 99506		(907) 384-7180	(907) 384-2447
DLA/DESC Europe	DLA/DESC Europe Pet. Lab	DSN	DSN
Pet. Lab	Rhein Ordnance Barracks	314-489-7326	314-489-7084
Unit 23135, Box 28	Bldg 320	COM	COM
APO AE 09227	Am Opelkreis	49-631-536-7326	49-6331-536-7084
	67663 Kaiserslautern, Germany		

6.6 <u>Changes from Previous Issue</u>. 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: Preparing activity:

Army - AV

Navy - AS

Air Force - 68
DLA - PS
(Project 91GP-1168)

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 www.dodssp.daps.mil or http://assist1.daps.dla.mil/quicksearch.