SUPPLEMENTAL QUALITY ASSURANCE PROVISION (SQAP)

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REV	DESCRIPTION	DATE	APPROVED
2022	Energy QAP E1 Contractor Inspection Responsibilities	03/28/2022	

ENERGY QAP E1 CONTRACTOR INSPECTION RESPONSIBILITIES. For use in domestic and overseas solicitations/contracts for all bulk aviation fuels, lubes, and additives, and bulk non-aviation fuels delivered by pipeline or waterborne transport, or as designated on the purchase request. When used in domestic and overseas PC&S solicitations/contracts, the QAP applies to all aviation fuel deliveries and other fuels delivered by pipeline or waterborne transport. **Use of this contract Text/(QAP) requires inclusion of QAPs E22 or E22.01, E40.01 and F109; use F14 or F51, if applicable.**

ENERGY QAP E1 (March 2022) CONTRACTOR INSPECTION RESPONSIBILITIES (DLA ENERGY)

(a) The following requirements of this Quality Assurance Provision (QAP), paragraphs (a) (1) through (a) (3), apply to JET A / JET A-1, with or without additives, transported by pipeline (fungible product only), waterborne transport, tank truck/trailer, intermodal, and rail car.

(1) Company Plan (Quality) - The contractor shall, as a minimum, have a written company plan in effect that ensures the quality of all aviation fuel supplied in performance of this contract. A copy of that plan, in English, shall be presented to the Government Quality Assurance Representative (QAR) prior to the initial shipment under this contract. The plan shall be reviewed annually and updated when deemed necessary by the Contractor or the Government, to include changes necessary to prevent the recurrence of quality problems. The annual review shall be performed by the Contractor and shall be documented in a manner that allows the QAR to validate the review date and who performed it. The Contractor shall sign and date the original plan, as well as each subsequent revision. Revisions shall also be presented to the QAR for review and acceptance prior to implementation. The following minimum elements are required:

(i) Contact information for key operational positions and a schematic diagram of facilities pertinent to the inspection system, indicating all inspection points,

(ii) Procedures for full specification testing, which shall be performed on each batch tank offered under this contract, and documentation of those test results on a Certificate of Quality (CoQ), Certificate of Analysis (COA), or other certificate that provides the required results;

(iii) Procedures for line injection of all additives at all locations within the Contractor's facility, to include where and when each additive will be line injected, how to assure that all additives are homogeneously blended into the aviation fuel and that no premixing of additives occurs;

(iv) Procedures for inspecting/ensuring tank trucks/trailers, intermodals and rail cars are suitable to load the aviation fuel furnished under this contract;

(v) When shipping via pipeline, procedures that ensure the aviation fuel being introduced complies with the specification in the contract and the pipeline company's specification for fungible aviation fuel;

(vi) Documentation

(A) When shipping via pipeline, a copy of the CoQ, COA, or equivalent, shall be provided to the QAR/Government representative for approval prior to shipment and the results shall be entered into the Statement of Quality Tab during submission of an Energy Receiving Report (ERR) in Wide Area Work Flow (WAWF).

(B) All additives line injected by the contractor shall be listed either on the CoQ, COA, or equivalent, or on the shipping document. Either the concentration of the additive or the quantity of additive line injected into the aviation fuel is required on the documentation;

SUPPLEMENTAL QUALITY ASSURANCE PROVISION (SQAP)			DEFENSE ENERGY SUPPORT CENTER 8725 JOHN J. KINGMAN RD FORT BELVOIR, VIRGINIA 22060-6222		
DISTRIBUTION STATEMENT - A	PREPARED BY HEIDBREDER.MICHAEL.G.1139641082 Digitally signed by HEIDBREDER.MICHAEL.G.1139641082 Date: 2022.03.28 15:27:41 -04'00'	DATE 03/28/2022	ITEM		
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(C) A copy of the CoQ, COA, or equivalent, and Bill of Lading shall be provided to the truck driver for all tank truck/trailer or intermodal shipments and the railroad representative for all rail car shipments. This documentation shall be provided to the QAR/Government representative for approval prior to discharge at the receiving location.

(2) The Contractor shall keep all quality and quantity records related to the performance of this contract complete and available to the Government during the performance of this contract and for three years after final payment under this contract.

(3) The contractor may provide transportation to/from/between contractor facilities and operations to the QAR/Government representative performing official duties relating to the administration of the contract and the contract price shall include the cost of any such transportation.

(b) The following requirements of this QAP, paragraphs (b) (1) through (b) (8), apply to aviation fuel (not covered in paragraph (a) above), F76, lubricating oil, and additive shipments. They also apply to all Posts, Camps, and Stations non-aviation fuel shipments via pipeline or waterborne transport.

(1) **QUALITY CONTROL PLAN (QCP).**

(i) The Contractor is required to provide and maintain an inspection system, and a written description QCP of that system, acceptable to the Government. The Contractor has the option to provide and maintain an inspection system that, as a minimum, incorporates the requirements of ISO9001, Quality Management Systems. If the Contractor chooses to comply with the ISO9001 quality system requirements and format, all the requirements set forth in QAPs contained in this contract shall be included in the resulting ISO9001 document that will serve as the QCP. A copy of the QCP, in English, shall be presented to the QAR for their review and acceptance prior to commencement of production or services. An acceptable QCP is required prior to Government inspection and acceptance of supplies or services. The QCP shall be reviewed annually and updated when deemed necessary by the Contractor or the Government, to include changes necessary to prevent the recurrence of quality problems. The annual review shall be performed by the Contractor and shall be documented in a manner that allows the QAR to validate the review date and who performed it. The Contractor shall sign and date the original QCP, as well as each subsequent revision. Revisions shall also be presented to the QAR for review and acceptance prior to implementation. When acceptable to the Government, the original QCP, and any revisions, shall be signed and dated by the QAR.

(ii) The Contractor shall require subcontractors to provide and maintain inspection systems that adhere to all the requirements in this QAP.

(iii) The QCP shall include contact information for key operational positions, a schematic diagram of facilities pertinent to the inspection system, indicating all inspection points, and a description of the following operations related to the supplies or services to be furnished under the contract:

(A) **RECEIVING, BLENDING AND COMPOUNDING.** Procedures to ensure the quality of additives blended into product supplied under this contract. Procedures to identify and ensure the quality of component base stocks used to produce finished product. Procedures for adding, prior to batching, all required additives at all locations. When procedures for in-line blending of non-aviation products in accordance with the IN-LINE BLENDING OF NON-AVIATION PETROLEUM PRODUCTS contract text/provision are used, the QCP shall provide for establishing blend ratios, and identify the responsible personnel within the Contractor's organization authorized to establish the blend ratios. When line injection of additives is required by the contract, the QCP shall provide procedures for proportionately injecting additives throughout the entire loading process, to ensure homogeneous blending of all additives into the product, and procedures for maintaining records evidencing the blending of all line-injected additives. In addition to the testing identified in paragraph (b)(1)(iii)(C) of this QAP, when additives are to be line injected, a laboratory hand blend of aviation fuel or F76 with all additives required by the contract shall be tested, prior to shipment, to verify compliance with the specification;

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(B) **SAMPLING.** Procedures for sampling additives, blend tanks, shipping tanks, lines, and conveyances/containers in accordance with American Petroleum Institute (API) Manual of Petroleum Measurement Standards (MPMS), Chapter 8, Section 1, (ASTM D 4057) Manual Sampling of Petroleum and Petroleum Products, and/or Section 2, (ASTM D 4177) Automatic Sampling of Liquid Petroleum and Petroleum Products. Procedures include sample location, frequency, quantity, and retention. For all tanker, barge, and pipeline shipments, a flow-proportional sample taken in accordance with MPMS Chapter 8, Section 2, is preferred at the custody transfer point. However, manual samples taken in accordance with MPMS Chapter 8, Section 1 are acceptable if they are taken hourly throughout the shipment and that the quantity of the composite sample meets the requirements in Table I Sample Retention.

(C) **TESTING.** Types of test series (See Table XVIII) and individual test methods/procedures to be performed on samples taken from each location identified in Table II, Minimum Sampling and Testing Requirements for Petroleum Products and Tables III - XV for tests required for the applicable product. For products not included in these tables, contact the QAR/Government representative for guidance.

(D) **CALIBRATION.** Program for testing and measuring equipment in accordance with ISO 10012, Measurement Management Systems - Requirements for Measurement Processes and Measuring Equipment, or equivalent local regulation, as appropriate; and a program for meters used to determine quantity complying with the API MPMS, Chapters 4, 5, and 6, or equivalent foreign standard. For items not covered by API, ASTM International, or Energy Institute (EI) publications, the applicable manufacturer recommended calibration method(s), outlined in the applicable industry publication, shall be used if acceptable to the Government;

(E) **STORAGE AND HANDLING.** Procedures for quality/quantity determination. Includes a description of storage and handling equipment, such as tanks, lines, valves, and manifolds; identification of dedicated/common product systems, including description of line segregation and controls to assure capability for proper gauging, sampling, draining of water, filtration, circulation, and drying; and identification of any other process/system used in maintaining product integrity during storage and handling;

(F) **LOADING AND SHIPPING - GENERAL.** Procedures for product movement and related quality/quantity checks from shipping tank(s) to custody transfer point (CTP). Description of transfer system from shipping tank to CTP. A dedicated system, including lines, pumps, loading arms, and hoses, is preferred, but an isolated common system incorporating blind flanges, spectacle plates, or double valves between systems is acceptable. An isolated common system using single valves designed to ensure positive isolation, such as twin seal single valves, is also acceptable. Systems with single valve (other than twin seal) isolation require specific procedures be included in the QCP to ensure product integrity prior to the CTP. When single valves (other than twin seal) are present in the system, the Contractor shall provide their quality control procedures, from the first single valve to the CTP, at time of bid to the Contracting Officer for a determination of acceptability. Procedures for conditioning and testing of isolated systems that last carried a product other than that intended for movement under this contract. For in-line blending of non-aviation products, where approved in this contract, requirements shall comply with the IN-LINE BLENDING OF NONAVIATION PETROLEUM PRODUCTS contract text/provision.

(G) **LOADING AND SHIPPING - TANK CARS, TANK TRUCKS, AND INTERMODAL CONTAINERS.** For direct deliveries using Contractor-supplied tank cars and tank trucks in dedicated same grade aviation fuel service, refer to the section of API 1595 entitled "Loading of Road/Rail Cars" for loading and shipping procedures. All other tank car, tank truck, and intermodal container loadings shall be in accordance with the following procedures: Confirm all compartments have been prepared in accordance with Table XVI, Conversion Chart for tank trucks (TT), tanks cars (TC), tank wagons (TW), tank & trailer (TRR), and intermodal containers (IMC). Whenever possible, ensure the same preparation procedures used for compartments are applied to hoses, manifolds, etc. Ensure that all conveyances are dry and free from loose rust, scale, and dirt. Provide for investigation of discrepancies in either recorded quality or quantity. When required by the contract, seal conveyance and record seal numbers on the shipping document. Strainers and filters shall be located as near the loading or filling point as practicable and shall be used as outlined below for all deliveries except deliveries into tanker, barge, or pipeline.

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(I) All aviation fuel shall be passed through strainers of 60 mesh or finer screen;

(II) All lubricating oil products, including preservatives, having a kinematic viscosity of 20.0 centistokes or less at 100 degrees Fahrenheit shall be passed through a 100 mesh or finer screen;

(III) All lubricating oil products, including preservatives, having a kinematic viscosity greater than 20.0 centistokes at 100 degrees Fahrenheit, but less than 22.0 centistokes at 210 degrees Fahrenheit, shall be passed through a 60 mesh or finer screen; and

(IV) The Contractor shall furnish and periodically inspect strainers and filters pursuant to this paragraph to determine condition and perform maintenance as necessary, keeping a written record thereof.

(H) **LOADING AND SHIPPING - TANKERS AND BARGES.**

(I) **For f.o.b. destination Contractor-supplied tankers/barges.** Procedures for the preparation of vessel cargo systems, in accordance with Energy Institute (EI) HM 50, Guidelines for the Cleaning of Tanks and Lines for Marine Tank Vessels Carrying Petroleum and Refined Products, that ensure the vessel is suitable to load the intended product(s). Particular attention shall be given to vessels that previously carried a Fatty Acid Methyl Ester (FAME) cargo. As a minimum, f.o.b. destination Contractors shall ensure that all cargo systems on the vessel intended for loading product under this contract, to include tanks, lines, manifolds, and pumps, are washed, gas freed, and inspected. In the event a solvent degreaser is utilized in the tank preparation process, a minimum of two rinses shall be performed by the vessel prior to loading aviation fuel. These procedures, and others deemed necessary by the Contractor, shall be included to ensure that the product meets the specification requirements at the CTP.

(II) **For f.o.b. origin Government-supplied tankers/barges.** Procedures for maintaining a time log of all significant events/ delays including vessel notice of readiness, vessel arrival, mooring, vessel deballasting, inerting and conditioning of cargo tanks, inspections, hose connections and disconnections, starts, stops, vessel release, or any other event that affects laytime of the vessel. Procedures for assuring condition of loading line (full of tested product, all air bled, and pressure packed) and gauging shore tanks, both before and after loading. In the event an automated metering system is to be used as the means of shore quantity determination, manual gauges of all storage tanks designated for shipment shall be taken prior to commencement of loading. Procedures for preload discussion between Contractor, vessel, and QAR/Government representative, to include, but not be limited to, prior three cargoes, cleaning procedures, loading plan, loading rates, sampling requirements, and after loading sampling and gauging. [Prior to loading - gauge, sample, and test On-Board Quantity (OBQ) or Remaining On-Board (ROB) cargoes designated for load on top. Gauge and sample (1 gallon) any other product on board, except for JPTS, and retain those samples.] All cargo quantities shall be calculated and volume corrected to 60°F or 15°C both before and after loading. Procedures for commencement of loading into one tank (up to 3 feet) or line displacement, whichever is greater, then switching to at most two other vessel tanks while first-in sampling and testing is being accomplished (See Table II). Procedures for the transportation of samples from the vessel to the testing facility. Monitoring the loading (including line blending and additive injection) from source to vessel, investigating irregularities immediately and stopping loading, if necessary. Procedures for investigating discrepancies in quality (mandated if off-specification or out of testing tolerance) and quantity (mandated if shore to ship variance is in excess of the following: 0.2% (0.002) for cargos not requiring cleaning, gas freeing, or drop/strip; 0.3% (0.003) for cargos requiring drop/strip; or 0.5% (0.005) for cargos requiring cleaning and gas freeing, or figures are suspect) on loaded conveyance.

(III) **For both f.o.b. origin and destination tankers/barges.** Procedures for immediately notifying the QAR/Government representative when irregularities occur or are suspected, and on all occasions when loading is interrupted. **Authority to release a government-furnished vessel rests with the QAR/Government representative after compliance and completion by the Contractor of all required operations, including the preparation of the DD Form 250-1 or Wide Area Workflow (WAWF) Energy Receiving Report (ERR) with Time Statement.**

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(I) **RECORDS AND REPORTS.** Procedures for completing and distributing required documentation both prior to and after the release of the vessel. Documentation shall include, as a minimum, test reports for all products and additives, additive blending and/or injection records, vessel notice of readiness, customs documents, bills of lading, vessel ullage reports, and the DD Form 250/DD Form 250-1 and continuation sheet(s) (or the WAWF ERR documents). Other documentation may be required on an as needed basis, such as vessel port logs, calibration records, and results of quality or quantity discrepancy investigations. These records and reports shall include by whom, where, and how they were prepared, as well as retention information. The DD Form 250-1 and DD Form 250-1 continuation sheet(s) or WAWF ERR with Time Statement shall be signed by the Contractor and the vessel representative in the appropriate blocks before presenting them to the QAR/Government representative for signature. The DD Form 250 and DD Form 250-1 or WAWF ERR documents shall identify the type, brand name, and amount of all additive(s).

(J) **CORRECTIVE ACTION.** Actions to be followed to effect correction of any deficiency affecting product quality or quantity, such as handling of off-specification product (waivers, conveyance rejections, etc.). The corrective action procedures shall include notification of the QAR/Government representative.

(iv) The QCP shall identify one individual to serve as a point of contact for quality/quantity matters relating to the inspection system description in the plan.

(v) The Contractor is responsible for all inspection systems, QCPs, and product quality and quantity.

(2) The Contractor shall perform all inspections and acceptance tests required by the specifications of the supplies to be furnished under this contract or, shall have such tests performed, in a laboratory acceptable to the Government. For f.o.b. destination Contractor-supplied tankers/ barges, the Contractor shall provide the QAR/Government representative, prior to the first shipment, with the name and location of the laboratory to be used for testing at each discharge point. The Contractor shall also notify the QAR/Government representative of any subsequent laboratory changes prior to the affected shipments. If any laboratory is determined to be unacceptable to the Government, the Contractor shall designate another laboratory that is acceptable, before acceptance testing can take place. Acceptance tests will normally be performed at the acceptance point. However, when such tests are performed at origin on supplies to be accepted at destination, documentation that will enable verification of the original test results shall be provided to the Government prior to acceptance at destination. Regardless of the method of delivery, products furnished under this contract shall meet all specification requirements at the CTP.

(3) Prior to loading, the Contractor shall inspect all shipping conveyances for suitability to load the supplies furnished under this contract, except for Government-furnished tankers and barges Authorization for the Contractor to participate in the inspection of Government-supplied tankers and barges rests with QAR/Government representative. The QAR/Government representative has the right to inspect any Government-supplied conveyance prior to loading and, in the event the Contractor and the QAR/Government representative disagree on the suitability to load such a conveyance, the determination of the QAR/Government representative shall govern. If the SHIPMENT AND ROUTING contract text/ provision is included in the contract, Government-furnished transportation equipment that is unsatisfactory for loading shall be reported by the Contractor in accordance with the terms contained in that contract text/provision. Procedures to determine suitability to load tank trucks and tank cars shall include, but not be limited to, visual inspection of interior compartments to assure cleanliness and dryness. Manifolds and hoses shall be drained and be clean and dry for the intended product. If the Contractor intends to witness operations at any point up to, and including, government acceptance, the Contractor is responsible for contacting the facilities to be visited and obtaining the required access.

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(4) When requested by the Government, the Contractor shall provide samples of each product furnished under this contract, in the manner and to the place designated by QAR. Such samples shall be provided without charge to the Government and shall be packed, marked, and shipped by the Contractor, at the Contractor's expense, in sampling containers and shipping boxes provided by the Contractor. During this contract, the Contractor shall be required to provide no more than five (ten in the case of aviation turbine fuel and F-76) 1-gallon samples under each contract line item (CLIN). The Contractor may be required to provide samples larger than 1-gallon, but in no case shall the total quantity for all samples under each CLIN exceed the quantities stated in this paragraph. The samples in this paragraph are in addition to any samples required elsewhere in this contract.

(5) The Contractor shall keep all quality and quantity records related to the performance of this contract complete and available to the Government during the performance of this contract and for three years after final payment under this contract. These records shall include, but not be limited to, DD Form 250 series or WAWF ERR series documents, documentation of internal inspections of all conveyances, laboratory certificates for all required testing (including those for the shipping tanks for f.o.b. destination tankers/barges), and documentation of quantity determinations.

(6) When a common system is to be used for shipment in accordance with paragraph (b)13)(iii)(F) of this QAP, the Contractor shall provide a list of all products carried by that system during the past year to the Contracting Officer, at the time of offer, for a determination of acceptability.

(7) The inspection system and related operations provided or performed pursuant to this QAP shall be subject to surveillance by the QAR/ Government representative.

(8) The contractor may provide transportation to/from/between contractor facilities and operations to the QAR/Government representative performing official duties relating to the administration of the contract and the contract price shall include the cost of any such transportation.

TABLE I, Sample Retention[1]

LOCATION	MINIMUM QUANTITY	RETENTION PERIOD [1]
Bulk Tank Cars/Tank Truck/Intermodal Container		
Additives	0.5-gallon (2 liters)[2]	Until receipt and quality verification of each lot/batch
Fuels	1 gallon (3 liters) [2]	15 days for fuels/45 days for lubricating oils
Lubricating Oils	0.25 gallons (1 liter) [2]	
AVGAS Drums	0,25 gallons (1 liter) (multi-drum composite) [3]	45 days
Shipping Tank(s)	2 gallons (8 liters) for Aviation Turbine Fuels 1 gallon (3 liters) for all other Fuels, Lubricating Oils, and Additives	45 days
Tanker/Barge/Pipeline (Composite Line at Custody Transfer Point)	2 gallon (8 liters) for Aviation Turbine Fuels 1 gallon (3 liters) for all other Fuels	45 days
Tanker/Barge (Composite)		
F.O.B. Origin	2 gallons (8 liters) for Aviation Turbine Fuels 1 gallon (3 liters) for all other fuels	45 days
F.O.B. Destination	2 gallons (8 liters)	Until shore tests on-specification
Tanker/Barge (Each Compartment)		
F.O.B. Origin	1 gallon (3 liters)	45 days
F.O.B. Destination	1 gallon (3 liters)	Until shore test on-specification

NOTES:

1. Unless otherwise noted in this document or applicable contract, the retention period shall be for the stated number of days after the sample has been taken from the location indicated.
2. If the conveyance is compartmentalized, a proportional sample shall be taken from each compartment such that a total of one liter is collected from the conveyance.
3. A one-liter composite sample of each product lot shall be taken from a predetermined number of randomly selected drums IAW Table III of API MPSM, Chapter 8.1 (ASTM D 4057).

TABLE II, Minimum Sampling and Testing Requirements for Petroleum Products Series 1, [1,13]

ITEM	WHEN TO SAMPLE		LOCATION OF SAMPLE	TYPE OF SAMPLE[2]	TEST REQUIRED[3]
1.a	Prior to Loading	Before acceptance of new materiel and after establishment of new batch[4] (Procurement)	Each shore storage tank	Single Tank Composite or All Levels	A
1.b	Prior to Loading	Prior to loading (Government Stock)	Each shore storage tank	Single Tank Composites or All Levels	B-1[1, 5]
1.c	Prior to Loading	After line pack but prior to loading (Procurement & Government Stock)	As close to the custody transfer point as possible	Line Sample	C[6,7] Dedicated System B-1 Non-Dedicated System
1.d	Prior to Loading	In coordination with vessel crew (Procurement & Government Stock)	Each vessel cargo compartment	Manual method or onboard ship equipment	Gauge or Ullage Report (Dry Tanks)
1.e	During Loading	After first in[9] (Procurement)	Vessel cargo compartment(s)	Spot	C[6,7,8]
1.f	During Loading	After first in[9] (Government Stock)	Vessel cargo compartment(s)	Spot	Appearance and Density[6,7,8]
1.g	During Loading	After first in[9] (Replenishment at sea)	Each vessel cargo compartment	Spot	C[6,7,8]
1.h	During Loading	During loading (Procurement & Government Stock)	As close to the custody transfer point as possible	Line Sample	Hourly Visual[6,8], Retain[10] Discard retain after passing 1.j tests
1.i	After Loading	After loading (Procurement & Government Stock)	Each vessel cargo compartment	All Level (Combine All Levels into one Multiple Compartment Composite Sample)	C [6,11] Remainder of B-1[12] (Retain fuel for B-1 referee testing)

NOTES:

1. Additional requirements to include retain samples may be required. See Quality Assurance Provisions (C or E-QAP) for further details or DFSP QCP.
2. Refer to ASTM International D4057 for sampling procedures.
3. Test results shall be compared against the quality release certificate. Any discrepancies shall be identified, investigated, and resolved.
4. Upon procurement at refineries, blending installations, etc. and at main installations including national depots & ocean importing points on establishment of new batches.
5. Government-owned stocks previously tested at any type B level test within 90 days need only type C (test FSII & SDA if present).
6. Test for FSII and SDA only if line injected.
7. If sample fails appearance (see 5.11.4.3) perform particulate matter IAW 5.2.1.10.1. Maximum particulate IAW Table I.
8. Lubricity also required for F-76 only if line injected.
9. First in shall be done after one (1) meter or after line displacement whichever is the greater.
10. For all tanker, barge, and pipeline shipments, a flow-proportional sample taken in accordance with MPMS Chapter 8, Section 2, is preferred at the custody transfer point. However, manual samples taken in accordance with MPMS Chapter 8, Section 1 are acceptable if they are taken hourly throughout the shipment and that the quantity of the composite sample meets the requirements in QAP E-1. For Government Shipments, pull a 1-quart sample hourly and retain until passing of 1.j B-1 tests.
11. Vessel may sail after "C" Tests; Remainder of B-1 tests to be completed before arrival at next load or discharge port. Test report will be provided to designated discharge port.
12. Type A level testing required for FOB Destination Procurements (unless otherwise specified by contract).
13. If a YON is being used as a barge, the QA requirements for waterborne transfer of petroleum products must be observed.

TABLE II, Minimum Sampling and Testing Requirements for Petroleum Products
Series 2, [1,8]

ITEM	WHEN TO SAMPLE		LOCATION OF SAMPLE	TYPE OF SAMPLE [2]	TEST REQUIRED[3]
2.a	Prior to Shipment	Before acceptance of new materiel and after establishment of new batch[4] (Procurement)	Each Shipment Storage Tank	Single Tank Composite or All Levels	A[10]
2.b		Prior to shipment (Government Stock)	Each Shipment Storage Tank	Single Tank Composite or All Levels	B-1[5]
2.c		After line pack but prior to loading/shipment (Procurement & Government Stock)	As close to the custody transfer point as possible	Line Sample	C[6,7] Dedicated System B-1 Non-Dedicated System
2.d	During Shipment	Immediately after start of loading/shipment (Procurement & Government Stock)	Downstream of the filter separator (if equipped) or closest to the custody transfer point as possible	Line Sample	C[6]
2.e		Hourly after start of loading or shipment Pipeline Only (Procurement & Government Stock)	Downstream of the filter separator (if equipped) or closest to the custody transfer point as possible	Line Sample	Apperance[6] (Retain fuel for B-1 referee testing)
2.f		Daily on first fill and anytime a new tank is placed on issue (after line displacement) TT, TC, ISO, Refuelers or other over the road transportation modes only (Procurement & Government Stock)	Downstream of the filter separator (if equipped) or closest to the custody transfer point as possible (Loading Rack or Fill Point)	Line Sample	Color (by visual method) and Appearance[6]. If visual fails perform C[7]
2.g	After Loading	Daily for each conveyance mode *Not required for pipeline operations (Procurement & Government Stock)	Each Cargo Compartment or another point that provides a representative sample	All Level	Appearance on each compartment C on composite [6,7,9]

NOTES:

1. Additional contractual requirements to include retain samples may be required. See Contract Quality Assurance Plans (C or E-QAPs) for further details
2. Refer to ASTM International D4057 for sampling procedures.
3. Test results shall be compared against the quality release certificate. Any discrepancies shall be identified, investigated, and resolved.
4. Upon procurement at refineries, blending installations, etc., and at main installations including national depots & ocean importing points on establishment of new batches.
5. Government-owned stocks that have been tested previously at any type B level test within 90 days need only type C (test FSII & SDA if present. Test for lubricity for F-76 when LIA is injected outbound only).
6. Test for FSII and SDA only if line injected.
7. If sample fails appearance (see 5.11.4.3), perform particulate matter IAW ¶ 5.2.1.10.1. Maximum particulate IAW IGRL
8. Type A level testing required for FOB Destination Procurements (unless otherwise specified by contract).
9. Road tank truck vehicles with multiple compartments shall have a 1-quart representative sample obtained from each compartment.
10. Filtration time testing is required for JP-4, JP-5 & JP-8 and shall meet MIL-STD-3004-1 Table I or contract requirement, whichever is more stringent.

TABLE II, Minimum Sampling and Testing Requirements for Petroleum Products
Series 3, product receipt and discharges for tankers and barges[6, 7, 8, 10]

ITEM	WHEN TO SAMPLE		LOCATION OF SAMPLE	TYPE OF SAMPLE	TEST REQUIRED
3.a	Prior to Discharge	Prior to discharge (Multi Product Cargo) (Procurement & Government Stock)	From each vessel cargo compartment	All Level	Appearance and Density[1,2]
3.b	Prior to Discharge	Prior to discharge (Multi Product Cargo) (Procurement & Government Stock)	From each vessel cargo compartment	All Level (Combine All Levels into one Multiple Compartment Composite Sample)	B-1[3]
3.c	Prior to Discharge	(Single Product Cargo) (Procurement & Government Stock)	From each vessel cargo compartment	All Level (Combine All Levels into one Multiple Compartment Composite Sample)	C[4,5]
3.d	During Discharge	Within 30 minutes after start and each hour after until completion (Procurement & Government Stock)	Dock/Discharge Manifold Header	Line Sample / Retain	Perform Appearance test[5,9] and then retain fuel for Referee testing
3.e	During Discharge	At 1 hour after start, Midpoint and 1 hour prior to completion (Procurement & Government Stock)	Dock/Discharge Manifold Header	Line Sample	Particulate (if applicable)
3.f	After Discharge	After receipt by waterborne vessel (Procurement & Government Stock)	Receipt tank	All Level	B-1
3.g	After Discharge	If remainder of fuel will be shipped to another DFSP (Procurement & Government Stock)	Each vessel compartment with fuel remaining on board	All Level	Retain until discharged at next destination

NOTES:

1. Test for flash point on high flash cargo tanks if low and high flash cargoes are carried together aboard the same vessel without segregated venting systems
2. If on-spec, discharge is authorized.
3. It is preferred that B-1 testing is completed before discharge. In the event capabilities do not exist or time does not allow, the vessel can be discharged once appearance and density testing is completed on each compartment per Table IX 3.a, and C[5] testing on the volumetric composite in 3.b. If B-1 testing is not completed prior to discharge, volumetric composite for 3b. shall be retained until receiving tank testing passes. Once discharging is completed, a B-1 test will be performed on the receiving tanks per Table IX 3.i. If receiving tank fails, a B-1 will be performed on retained fuel.
4. Discharge is authorized after conformance with type C tests, and the provisions of Section 5.1.3.1 are met. Retain composite sample until the receiving tank analysis is complete. If product fails, perform B-1 tests on retain composite to help determine the cause of the off-specification problem.
5. For aviation fuel delivery, FSII and SDA shall be tested only if line injected. This requires an additional quart sample.
6. Refer to ASTM International D4057 for sampling procedures.
7. Flash Point at the receiving point is not required for product used by the U.S. Army. This fuel is tested IAW Petroleum Laboratory Operations (TM 4-43.31)
8. Type A level testing required for FOB Destination Procurements (unless otherwise specified by contract).
9. Test for additives if line injected downstream of the injector. (If line injecting LIA into F-76, test for lubricity.)
10. If a YON is being used as a barge, the QA requirements for waterborne transfer of petroleum products must be observed.

TABLE III, Tests required aviation gasoline[3]

PROPERTIES	B-1 TEST	B-2 TEST	B-3 TEST	C TEST
Appearance [1,2]	X	X	X	X
Color (Visual)	X	X	X	X
Density or API gravity	X	X	X	X
Distillation	X	X	X	
Copper strip corrosion	X	X	X	
Existent gum	X	X		
Vapor pressure	X	X		
Free water determination[2]	X	X	X	
Lead content	X	X		
Potential gum		X		
Color (Saybolt)				
Freeze Point				
Knock Value				
Total Sulfur				
Oxidation Stability				

NOTES:

1. Obtain sample in a clear round 1 quart glass bottle, swirl the bottle vigorously so a vortex is formed. Visually check for sediment at the point of the vortex. If sediment is visible, an investigation is necessary in order to determine the source of the contaminant (a spot larger than 3 mm diameter indicates corrective action may be required to prevent the delivery of contaminated fuel).
2. AVGAS samples shall be checked for particulate and water. Particulate shall be determined visually upstream of filter separators and/or by the particle assessment method downstream of the filter separator. Free water shall be determined downstream of filter separator using a water detector (AEL Aqua-Glo test method or Hydro-Light).
3. For determining correct testing results (rounding protocol) see 4.2.2.2.1 Testing Rounding Protocol

TABLE IV, Tests required for aviation turbine [7]

PROPERTIES	B-1 TEST	B-2 TEST	B-3 TEST	C TEST
Appearance [1]	X	X	X	X
Color (visual)	X	X	X	X
Density or API gravity	X	X	X	X
Particulate matter	X	X	X	
Distillation	X	X	X	
Copper strip corrosion	X	X	X	
Freezing point	X	X	X	
Existent gum	X	X	X	
Vapor pressure (JP-4 only)	X	X	X	
Flash point (except JP-4) [11]	X	X	X	X
Water reaction[2]				
Lead content (If contaminated with leaded fuels suspected)	X	X	X	
Fuel system icing inhibitor [3]	X	X	X	
Filtration time	X	X	X	
MSEP (JP-4, JP-8, F-24, F-27, Jet A & Jet A-1) [4,5]	X	X	X	
Conductivity (JP-4 and JP-8, F-24, F-27 & Jet A-1) [6]	X	X	X	
Thermal stability (B-1 requirement applies only to JPTS and marine/multi-product mode receipt tank sample)[10]	X	X		
Color (Saybolt)		X		
Acid number		X		
Peroxide Number [8]		X		
Fatty Acid Methyl Ester (FAME) [9]	X	X	X	

NOTES:

1. Obtain sample in a clear round 1 quart glass bottle, swirl the bottle vigorously so a vortex is formed. Visually check for sediment at the point of the vortex. If sediment is visible, an investigation is necessary to determine the source of the contaminant (a spot larger than 3 mm diameter indicates corrective action may be required to prevent the delivery of contaminated fuel).
2. Optional or at the request of Service Control Point.
3. If product contains FSII, product shall be checked on delivery into a bulk storage tank and every month thereafter.
4. If the capability does not exist to perform this test at the terminal, send sample to the nearest Service laboratory that has capability. In the event operational necessity dictates issue of product before results are obtained from the Service laboratory, shipments may be made, however, when laboratory results indicate failure, notify DLA Energy Quality Operations Division.
5. In all cases where MSEP is measured, conductivity will also be measured using ASTM D2624. For unadditized Jet A that is injected outbound of a facility an MSEP shall be performed using either D7224 or D8073 where possible. If either method is not available testing may be conducted with D3948. Passing results for D3948 will be considered acceptable. Failing fuels shall be retested using D7224 or D8073. If the fuel passes D7224 with a minimum limit of 85 or D8073 with a limit of 88 the fuel is considered to be acceptable with no further action. If the fuel fails D7224 or D8073, an investigation shall be performed.
6. If fuel contains conductivity additive, wait approximately 2 minutes after obtaining sample for charges in the fuel to dissipate before performing CU testing.
7. For determining correct reporting of test results (rounding protocol) see 4.2.2.2.1 Testing Rounding Protocol
8. Only applicable to Jet A use by the Navy.
9. Only for product transported through multi-product systems, including marine transport.
10. For JPTS: Ellipsometer (ETR) or Interferometer (ITR) IAW QAP C16.08-13. ETR is the referee. For all other fuels, follow specification requirements (excluding MSC chartered/contracted tankers and barges in dedicated/long term service).
11. Flash Point at the receiving point is not required for product used by the U.S. Army. This fuel is tested in accordance with Petroleum Laboratory Operations (TM 4-43.31).

TABLE V, Support for secure fuel [4]

	JP-5		Jet A		Jet A-1 [7]		JP-8		F-24	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Appearance [2]	C&B	C&B	C&B	C&B	C&B	C&B	C&B	C&B	C&B	C&B
Gravity, API @ 60 °F D1298/D4052	36.0	48.0	37.0	51.0	37.0	51.0	37.0	51.0	37.0	51.0
Density at 15°C (kg/m^3)	788	845	775	840	775	840	775	840	775	840
Weight: lb/USG Calculated	6.6	7.0	6.5	7.0	6.5	7.0	6.5	7.0	6.5	7.0
Distillation (°C) D86 [3]										
10% Recovered		205		205		205		205		205
20% Recovered		Report						Report		
50% Recovered		Report		Report		Report		Report		Report
90% Recovered		Report		Report		Report		Report		Report
Final Boiling Point		300		300		300		300		300
Freezing point, °C D5972/D2386		-46		-40		-47		-47		-40
Flash point, °C D93/D56	60		38		38		38		38	
Particulate Matter (mg/L) D2276, D5452, MIL- DTL- 83133		0.5		0.5		0.5		0.5		0.5
Conductivity (pS/m) D2624			Report		Report		50	700	50	700
Copper strip corrosion D130		No.1		No.1		No.1		No.1		No.1
Existent gum (mg/100 mL) D381		7		7		7		7		7
FSII, (vol %) D5006 [1]	0.07	0.20					0.04	0.15	0.04	0.15
Thermal Stability D3241										
Change in pressure drop, mm Hg		25		25		25		25		25
One of the tube deposit rating methods shall be run: (1) Ellipsometer (ETR) [6] (nm) or Interferometer (ITR) (nm)		85		85		85		85		85
(2) Heater tube deposit, Visual Tube Rating (VTR)		< 3		< 3		< 3		< 3		< 3
Fatty Acid Methyl Ester (FAME) [5]		50		50		50		50		50

NOTES:
1. Only use FSII meeting specification MIL-DTL-85470, Inhibitor, Icing, Fuel System, High Flash, NATO Code S-1745.
2. Fuel shall be clear, bright, and free of water and sediment on visual examination. Sample will be taken downstream of final filtration on refueler or hydrant servicing equipment.
3. Distillation property criteria are specified in ASTM D86 scale units. ASTM D2887 results shall be converted to estimated D86 results by application of the correlation in Appendix X4, "Correlation for Jet and Diesel Fuel (Procedures A and B)" of D2887 for comparison with the specified property criteria. Distillation residue and loss limits provide control of the distillation process during the D86 test method and do not apply to D2887.
4. Alternate test methods may be performed provided they are authorized by the specification of the product being tested. Referee test methods are preferred.
5. Only for product transported through multi-product systems. FAME (fatty acid methyl esters) is defined as material meeting the limits of EN14214 or ASTM D6751. FAME that fails to meet the biodiesel quality standards are not permitted in aviation turbine fuel.
6. Tube deposit rating shall be measured by ASTM D3241 ETR Ellipsometer (ETR), when available: otherwise, use Interferometer (ITR) or visual (VTR). ETR shall be the referee procedure, otherwise ITR.
7. DEF STAN 91-091, ASTM D1655 and GOST R 52050 are acceptable.

TABLE VI, Tests required for automotive gasoline

PROPERTIES	B-1 TEST	B-2 TEST	B-3 TEST	C TEST
Appearance	X	X	X	X
Color (Visual)	X	X	X	X
Water and Particulate (Visual Check)	X	X	X	X
Density or API gravity	X	X	X	X
Distillation	X	X	X	
Vapor pressure	X	X		
Copper strip corrosion		X	X	
Unwashed gum/Solvent-washed gum		X	X [1]	
Knock rating (RON and MON)	X [2]	X [2]		
Oxidation stability		X		

NOTES:
1. Unwashed gum, without solvent wash, shall not increase by more than 2 mg as compared to the original product. In the event of gum increase exceeding 2 mg, run type A test as defined in the legend.
2. Perform only if Lead Content is performed and fails and/or contamination with another product is suspected. In the case of pipeline, this test shall be performed when considered necessary.

TABLE VII, Tests required for E85 (ASTM D5798) [1, 2]

PROPERTIES	B-1 TEST	B-2 TEST	B-3 TEST	C TEST
Appearance	X	X	X	X
Water	X	X	X	
Ethanol Volume	X	X	X	
Vapor Pressure	X	X	X	
Sulfur		X	X	
Acidity		X		
Solvent Washed Gum	X	X		
pH		X		
Unwashed Gum		X		
Copper	X	X		

NOTES:
1. For cleaning see 5.9.4.2
2. In accordance with DOE Handbook for Handling, Storing and Dispensing E85 and Other Ethanol- Gasoline Blends, it is recommended at a minimum to test the following every one to two months: electrical conductivity, particulate content, hydrocarbon content (D5501 with D5798), water content and RVP. The DOE Guidebook link is https://www.afdc.energy.gov/uploads/publication/ethanol_handbook.pdf (May need to save file vs open document)

TABLE VIII, Tests required for diesel fuels and kerosene

PROPERTIES	B-1 TEST	B-2 TEST	B-3 TEST	C TEST
Appearance [1]	X	X	X	X
Color (Visual)	X	X	X	X
Density	X	X	X	X
Distillation	X	X		
Flash point	X	X	X	X
Carbon residue (F-76 only)	X	X		
Cloud point		X		
Pour point (F-76 only)		X		
Copper strip corrosion		X		
Cetane index [2]		X		
Viscosity (F-76 only)		X		
Water & sediment by centrifuge		X		
Particulate (F-76 only)	X	X		
Storage stability (F-76 only)		X		
Sulfur [3, 4]	X	X		
Fatty Acid Methyl Ester (FAME) (F-76 only)	X	X		
Lubricity (F-76 only)	X	X		

NOTES:

1. For NATO F-76, if the sample has no visible particulates, but is otherwise not clear and bright per ASTM D4176, procedure 1, then the product shall meet the requirements of ASTM D2709, 0.05 percent volume of water and sediment, maximum. The fuel is acceptable for appearance if the water and sediment content is
0.05 percent volume or less. If the sample fails ASTM D4176, procedure 1, because it contains visible sediment or particulate matter, but meets the requirement of 10 mg /L, maximum, in accordance with ASTM D5452 or ASTM D6217, then the fuel shall be considered acceptable provided all other requirements are met.
2. Cetane Index can only be run if no ignition improvers are present. Otherwise, Cetane number shall be given.
3. Kerosene. Grade No.-1K only, if intended for non-flue connected burner.
4. Sulfur testing is required for ULSD or LSD believed to be contaminated with a higher sulfur content fuel.

TABLE IX, Test required for BDI

PROPERTIES	B-1 TEST	B-2 TEST	B-3 TEST	C TEST
Appearance [1]	X	X	X	X
Distillation	X	X		
Flash Point	X	X	X	X
Cloud Point or LTFT/CFPP		X		
Viscosity		X		
Copper Strip Corrosion		X		
Water and Sediment		X		
Sulfur		X		
Ramsbottom Carbon Residue	X	X		
Particulate Content	X	X		
Acid Number		X		
Ash Content	X			
Biodiesel Content	X	X	X	
Oxidation Stability		X		

NOTE:

1. Obtain a sample in a clear round 1 quart bottle, swirl the bottle vigorously so a vortex is formed. Visually check for sediment at the point of the vortex. If sediment is visible, an investigation is necessary in order to determine the source of contamination.

TABLE X, Tests required for burner fuel oils

PROPERTIES	B-1 TEST	B-2 TEST	B-3 TEST	C TEST
Flash point	X	X	X	X
BS&W [1] (centrifuge)	X	X	X	X
Density/API Gravity	X	X	X	X
Viscosity	X	X		
Ash		X		
Carbon Residue	X			
Sediment by extraction		X		
Pour point		X		

NOTE:
1. Perform only if water is observed.

TABLE XI, Tests required for residual marine fuel (RME 180 grade)

PROPERTIES	B-1 TEST	B-2 TEST	B-3 TEST	C TEST
Kinematic Viscosity	X	X	X	X
Density at 15º C	X	X	X	X
Flash Point	X	X	X	X
CCAI		X		
Hydrogen Sulfide		X		
Acid Number		X		
Total sediment aged	X	X		
Carbon Residue	X	X		
Sulfur		X		
Pour Point		X		
Water	X	X		
Ash		X		
Sodium		X		

TABLE XII, Tests required for residual marine fuel (RMG 380 grade)

PROPERTIES	B-1 TEST	B-2 TEST	B-3 TEST	C TEST
Kinematic Viscosity	X	X	X	X
Density at 15º C	X	X	X	X
Flash Point	X	X	X	X
CCAI		X		
Sulfur		X		
Hydrogen Sulfide		X		
Acid Number		X		
Total sediment aged	X	X		
Sulfur		X		
Pour Point		X		
Water`	X	X		
Ash		X		
Sodium		X		

TABLE XIII, Test required for marine gas oil (DMA grade)

PROPERTIES	B-1 TEST	B-2 TEST	B-3 TEST	C TEST
Kinematic Viscosity		X		
Density at 15 º C	X	X	X	
Flash Point	X	X	X	X
Cetane Index		X		
Sulfur		X		
Oxidation Stability	X	X		
Acid Number		X		
Carbon Residue	X	X		
Pour Point		X		
Appearance	X	X	X	X
Fatty Acid Methyl Ester (FAME)	X	X		

TABLE XIV, Tests required for bulk lubrication oils [1, 2]

PROPERTIES	B-1 TEST	C TEST
Appearance (to include visual sediment & water)	X	X
Emulsion test [3]	X	
Density or API Gravity	X	X
Viscosity [4]	X	
Flash point	X	
Foam test	X	
Water [3]	X	
Solid contaminants [3]	X	

NOTES:

1. For application of these tests see Table IX.
2. B-2 tests are listed in Table XXII.
3. Only if the specification has this requirement.

. For MIL-PRF-17331 and MIL-PRF-9000 viscosity is not required unless the tank has been in long term storage for 3 months.

TABLE XV, Type B-2 tests for bulk lubricating oils [2]

CHARACTERISTICS	SPECIFICATION			
	MIL-PRF-6081 (LA6)	MIL-PRF-9000 (LO6)	MIL-PRF-17331 (LTL)	MIL-PRF-32644 (CLB)
Appearance / workmanship	X	X	X	X
Color	X			
Viscosity @ 100°C		X	X	X
Viscosity @ 54°C				
Viscosity @ 40°C	X [1]	X	X	X
Viscosity @ -40°C	X			
Viscosity @ -54°C	X			
Relative density				X
Flash point	X	X	X	X
Pour point		X	X	X
Acid number	X		X	X
Total Base number		X		
Copper strip corrosion	X		X	X
Corrosion & oxidation stability	X			
Evaporation loss				
Precipitation number				
Ash/Sulfated Ash		X		X
Emulsion			X	
Foam test		X	X[1]	X
Water content			X	
Particulate content / trace sediment	X		X	X
Trace metals				
Hydrolytic stability				
Minimum retest frequency (months)	36	24	24	36
Visual check frequency (months)	12			
Military symbol(s)	None	9250	2190-TEP	None
NATO Code Numbers	O-133	O-278	O-250	None

NOTES:

1. Option A may be used for Government owned 2190 TEP if the conditions are met as required by ASTM D892.
2. For packaged product information refer to MIL-STD-3004-2. Only an approved laboratory under the DoD Shelf-Life Program can authorize a shelf-life extension of any item. For laboratories that cannot perform the full B-2 series tests, recommend the following statement be included in the remarks section of the lab report: "All required tests for shelf-life extension were not performed. This lab report does not give authorization to extend the shelf-life extension of this item."

TABLE XVI, Conversion chart for tank trucks (TT) tank cars (TC), tank wagons (TW), tank & trailer (TRR), and intermodal containers (IMC)[1, 2]

Last Product Carried	PRODUCT TO BE LOADED[5]								
	Gasolines: MUR, MUM, MUP, EFM, E85, 100, 130, JP-4, JAB	Aviation Turbine Fuels: JAA/A1, JP-8, F-24, JP-5, TS1, KS1/R/N,	Aviation Turbine Fuel[3]: JPTS	RP1/RP2	JP-10/PF1	Diesel Fuel: F-76	FSII	Lubricating Oils	Diesel Fuels: DF1, DF2, DS1, DS2, DSS, DSW, BDI, MGO
Gasolines[4] MUR, MUM, MUP, EFM, E85, 100, 130, JP-4, JAB	Drain/Empty	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry
Aviation Turbine Fuels[4, 9] JAA/A1, JP-8, F-24, JP-5, TS1, KS1/R/N,	Drain/Empty	Drain/Empty	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry
Aviation Turbine Fuel[3] JPTS	Drain/Empty	Drain/Empty	Drain/Empty	Drain/Empty	Steam/Dry	Steam/Dry	Steam/Dry	Steam Dry	Steam/Dry
RP1/RP2	Steam/Dry	Steam/Dry	Steam/Dry	Drain/Empty	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry
J10/PF-1	Steam Dry	Steam/Dry	Steam/Dry	Steam Dry	Drain/Empty	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry
Petroleum Solvent or Paint Thinner	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry
Diesel Fuel: F-76	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Drain/Empty	Steam/Dry	Steam/Dry	Drain/Empty
Diesel Fuels[4] DF1, DF2, DS1, DS2, DSS, DSW, MGO	Steam/Dry	Steam/Dry[7]	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Drain/Empty
FSII (SIH)	Drain/Empty	Drain/Empty	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Drain/Empty	Steam/Dry	Steam/Dry
Lubricating Oils	NO LOAD	NO LOAD	NO LOAD	NO LOAD	NO LOAD	NO LOAD	NO LOAD	Steam/Dry[6]	Steam/Dry
Biodiesel Blends(≤B15)[4] DF1, DF2, DS1, DS2, DSS, DSW	Steam/Dry	Steam/Dry[7]	NO LOAD	NO LOAD	NO LOAD	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry
Biodiesel Blends(>B15): DF1, DF2, DS1, DS2, BDI	NO LOAD	NO LOAD	NO LOAD	NO LOAD	NO LOAD	NO LOAD	NO LOAD	NO LOAD	Steam/Dry[8]
Heavy Fuel Oils, Distillate Fuels[4] FS1, FS2, FS4, FS5, FS6 Residual Fuel Oils: ISO 8217, class F (IFOs)	NO LOAD	NO LOAD	NO LOAD	NO LOAD	NO LOAD	NO LOAD	NO LOAD	NO LOAD	Steam/Dry
Naphtha	Drain/Empty	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry	Steam/Dry

TABLE XVI Continued, Conversion chart for tank trucks (TT) tank cars (TC), tank wagons (TW), tank & trailer (TRR), and intermodal containers (IMC)[1, 2]

NOTES:

1. For previous cargoes not listed, contact DLA Energy Product Technology and Standardization Division at DLAEnergyProductTechnology@dla.mil for acceptability/cleaning procedures.
2. General Instructions for Tank Cars and Trucks
   a. Conveyances (all) shall be dry and free from loose rust, scale, and dirt
   b. Saran lined equipment should not be steam cleaned; water wash should suffice.
   c. Petroleum products shall not be loaded into the conveyances where the previous cargo was caustic, acid, or chlorinated solvents.
   d. Tank trucks and cars in liquid fertilizer service shall not load aviation turbine fuels directly but shall carry out at least two loads of commercial gasoline prior to the aviation turbine fuel load.
   e. Conversion of Government-owned tank cars from liquid fertilizer service to aviation turbine fuel service shall only be done when no other alternative exists. Tank cars being converted from liquid fertilizer service to a petroleum product shall be adequately cleaned to remove all traces of liquid fertilizer. At a minimum, the equipment must be steam cleaned; dried and must be free from loose rust, scale, and dirt. After cleaning, but before loading aviation turbine fuels, at least two loads of commercial gasoline shall be carried prior to loading aviation turbine fuel. Equipment with unlined compartments should have its compartments lined with an approved coating at this time. Conveyances carrying their initial load of aviation turbine fuel following conversion shall not be released from the loading until they have been sampled a minimum of 24 hours after loading. In accordance with MIL-STD-3004-1A, samples shall undergo type B-2 testing plus Thermal Stability Test (if required by the product specification). After type B-2 tests indicate compliance with specification requirements, the conveyance can be released pending results of the Thermal Stability tests. The conveyance shall not be unloaded until the loading point notifies the destination that the Thermal Stability test (when required) has passed. When the above condition applies, the DD-250, Wide Area Workflow (WAWF) Energy Receiving Report (ERR) or equivalent form shall be so noted.
3. To be loaded only in aluminum or stainless-steel conveyance, or other conveyance lined with an approved epoxy coating. If equipment is coated, clean with hot fresh water not exceeding58°C (136°F) and dry thoroughly.
4. If previous cargo contained dye marker, all traces of color must be removed.
5. If product to be loaded does not contain dye, then the vehicle shall not contain any traces of dye prior to loading.
6. Drain/empty only when same specification product is being loaded.
7. Prior to loading the aviation fuels listed, the conveyance must have carried a previous non-FAME cargo and then be steam cleaned and dried. Trucks that have previously carried biodiesel create a risk of cross-contamination of aviation turbine fuel with residual biodiesel components. Diesel fuel may contain up to 5% FAME without reporting it as biodiesel. Because of the difficulties in making a load-rack of the presence of FAME in the previous load, the more stringent “Steam/Dry is required.
8. Drain and empty if loading biodiesel blend.
9. Cargos carrying dyed kerosene shall use the steam/dry cleaning procedure.

TABLE XVII, Minimum Requirements for the Preparation of Barge and Tanker Cargo Tanks [1, 2]

LAST PRODUCT CARRIED (For information regarding 2nd and 3rd to last cargoes see note 8.)	PRODUCT TO BE LOADED							
	Gasolines[4,5]: MUR, MUM, MUP, EFM, E85, 100, 130, JP4, JAB	Jet Fuels: JAA/A1, JP8, F24, TS1, KS1/R/N	Jet Fuel: JP5	Jet Fuel: JPTS	Diesel Fuel: F76 Sulfur greater than 15 ppm and less than or equal to 15ppm	Diesel Fuels with B5 or less[5]: DF1, DF2, DS1, DS2, DSS, DSW, MGO	Biodiesel Blends greater than B5[5]: DF1, DF2, DS1, DS2, DSS, DSW	Heavy Fuel Oils: ASTM D396 (FS4, FS5, FS6) ASTM D975 (No. 4D) Residual Fuel Oils: ISO 8217, Class F (IFOs)
Gasolines[5]: MUR, MUM, MUP, EFM, E85, 100, 130, JP4, JAB, Naphtha, Reformate and Alkylate	A	A, B	A, B	F	A, B	A	A	A
Jet Fuels: JAA/A1, JP8, F24, TS1, KS1/R/N[9]	A	A	A, B	F	A, B	A	A	A
Jet Fuel: JP5	A	A	A	F	A, B	A	A	A
Jet Fuel: JPTS	A	A	A, B	A	A	A	A	A
Diesel Fuel (ULSD): F76 Sulfur less than or equal to 15 ppm	A, B	A, B	A, B	F	A	A	A	A, C
Diesel Fuel: F76 Sulfur greater than15 ppm	A, C	A, C	A, C	NO LOAD	A	A	A	A, C
Diesel Fuels with B5 or less[5]: DF1, DF2, DS1, DS2, DSS, DSW, MGO	A, C	A, C	A, C	NO LOAD	A, C	A, C	A	A, C
Biodiesel Blends greater than B5[5]: DF1, DF2, DS1, DS2, DSS, DSW	E	E	E	NO LOAD	A, C	A, C	A	A, C
Heavy Fuel Oils: ASTM D396 (FS4, FS5, FS6) ASTM D975 (No. 4D) Residual Fuel Oils: ISO 8217, class F (IFOs)	NO LOAD	NO LOAD	NO LOAD	NO LOAD	A,D	A,D	A,D	A
Crude[3]	NO LOAD	NO LOAD	NO LOAD	NO LOAD	NO LOAD	NO LOAD	NO LOAD	NO LOAD
Lube Oils	NO LOAD	NO LOAD	NO LOAD	NO LOAD	A, D	A, D	A, D	A
Water soluble chemicals[6]	A,C	A,C	A,C	F	A,C	A,C	A,C	A,C

Table XVII Continued, Water Soluble and/or Water Miscible Chemicals

Product Name	Minimum Required Cleaning Procedures	Product Name	Minimum Required Cleaning Procedures
2-Butanone	A,C	Isopropanol, 91 %	A,C
1,4 butanediol	A,C	Isopropanol, Anhydrous	A,C
15W-50 (syn.hydrocarbons & additives)	A,C	Malaic Anhydride	A,C
2-Butanol	A,C	Maquat	A,C
2-Hydroxyethly Methacrylate (HEMA)	A,C	Methanol	A,C
Butendiol	A,C	Methyl Amyl ketone	A,C
CHRYSO	A,C	Methyl Pyrrolidone	A,C
Coralube 737 RB (= hexylene glycol)	A,C	Methyl Salicylate C8H8O3	A,C
Diethanolamine, IMO 9/ UN 3082/PG III	A,C	Monoethanolamine	A,C
Diethylene Trianine	A,C	Mpdiol Glycol	A,C
Diethylketone	A,C	MS (mineral sprint) rule 66	A,C
Dimethylacetamide (DML)	A,C	MTBE	A,C
Dipropylene Glycol	A,C	Eastman EB Solvent,	A,C
dipropylene glycol methyl ether (DPM)	A,C	Neodol 23-6.5	A,C
Diquat concentrate	A,C	N-Methyl-2-Pyrrolidone, Non Haz.	A,C
DOW 200	A,C	n-Propanol	A,C
DOW Froth 250	A,C	Petresul 550	A,C
Eastman Glacial Acetic Acid	A,C	Propyl Alcohol Sasol	A,C
Ethanol, Anhydrous	A,C	Propylene Carbonate, Non Haz.	A,C
Ethoxylated Sorbitan Laurate	A,C	Propylene Glycol Ethyl Ether (EPG)	A,C
Ethylene Carbonate, Non Haz.	A,C	Propylene glycol methyl ether (PM)	A,C
Ethylenediamine (EDA)	A,C	Terathane 2900 polyether glycol	A,C
Floquat (FL 4620 PWG)	A,C	Tetrahydrofuran (THF)	A,C
furfural alcohol	A,C	Triehtylene Glycol Ethyl Ether (ETG)	A,C
Furfurayl alcohol	A,C	triethanolamine 99	A,C
Gamma Butyrolactone	A,C	Triethylene Glycol	A,C
Glycerol	A,C	Tripropylene Glycol	A,C
Glycol Ether DB Acetate	A,C	UAN (Urea Ammonia Nitrate)	A,C
Glycol Ether PNP	A,C		
Hitec 614 (benzene sulfonic acid -calcium salt)	A,C		

TABLE XVII Continued, Vessel Cleaning Requirements Legend and Notes

A	All cargo lines shall be dropped, tanks stripped, ballast residue removed.
B	All cargo and vent lines shall be drained of previous product and flushed with cold water. Cargo tanks must be thoroughly machine washed using cold water.Cargo tanks must be free of water, loose rust, sludge, mud, silt, etc.
C	The same as for "B," except that hot water shall be used instead of cold. If tank interiors are coated, water temperature should not exceed 58°C (136°F).
D	Cargo tanks and systems shall be processed in accordance with the instructions contained in EI HM 50 Guidelines for the cleaning of tanks and lines for marinetank vessels carrying petroleum and refined products.
E	Not to be loaded without special cleaning instructions. Three clean product/zero biological content intermediate cargoes required. (See Note 5 below)
F	Special tank preparations and cargo handling is required for JPTS, to prevent contamination. Tanks used for loading must be stainless steel or coated with an approved epoxy. Coating must be adherent: no flaking, peeling, or blistering. Prior to loading JPTS, tank cleaning requirements are: tanks must be machine washed with hot water, if cleaning chemical and/or salt water is used, the final wash must be with fresh water. Tank bottoms, interior bulk heads, and internalsmust be completely free of sediment, scale, and other contaminants. Tanks must be dry and all liquids completely removed from the tank's lines after cleaning,must be flushed with fresh water, drained and free of all water. Loading and unloading system must be completely isolated. This will be accomplished by completely separate piping systems or by use of blinds. Valves will not be depended on to effect isolation. Cargo tank valves will not be considered as part of the "double block" requirement for cargo system segregation. No common lines will be used. Steam smothering lines should have at least two valves that can be sealed from the main line to the tanks, or a blind installed that can be readily removed. Each tank will have its own individual vent. If ship has a common vent system, tanks used for JPTS must be isolated from balance of the vent system.

NOTES:

1. See Vessel Cleaning Requirements Legend for cleaning type code (A, B, C, D, E, F) details.
2. This table is included as a guide only. Requirements for tanker cleaning are determined by MSC vessel cleaning policy. Contact DLA Energy Quality Operations Division for tank cleaning requirements for any product not listed in the Table. If tank contains ballast water or water used for tank cleaning/washing, every effort shall be made to remove this free water to the minimum level possible by draining or by use of a pump.
3. There are no circumstances where a crude carrier is capable of cleaning tanks, pumps and lines sufficiently to load an aviation fuel immediately after a crude cargo.Crude carriers converted to a distillate diesel, aviation fuel or naphtha-based fuel must carry three cargoes of a commercial like product without a quality incident.
4. Gas free, lift scale and mop. Consideration may be given to substituting mopping by enhanced stripping and drying per EI (Energy Institute) HM 50 Guide.
5. FAME (Fatty Acid Methyl Ester) Contamination:

Aviation Gasoline or Aviation Kerosene/Turbine Fuel (Aviation Fuel Products)

- To avoid contamination from FAME in Aviation Gasoline, Aviation Kerosene/Turbine Fuel cargoes. See below instructions.

-- Following cargoes with pure biodiesel (B100) or any cargo with FAME content greater than 5 vol % (B5): Prior to loading Aviation Fuel Product cargoes requires three intermediate cargoes of a compatible fuel product. The three intermediate cargoes SHALL NOT contain FAME content greater than 5 vol % (B5). When any of the last three cargoes have consisted of diesel or heating oil products, FAME testing shall be conducted for each cargo; *attestation as described in the RFP is not sufficient for these products.* Examples of diesel or heating oil products include, but are not limited to, F-76, DF1, DF2, DS1, DS2, DSS, DSW, MGO, Gasoil, FS1, FS2, FS4, FS5, FS6, and IFO. Evidence by presentation of CoQs representing the last three cargoes with FAME testing (EN 14078 and ASTM D7371) demonstrating B5 or less shall be provided as proof. In scenarios where FAME testing (EN 14078 and ASTM D7371) was not conducted for a diesel or heating oil product, or such data is unable to be provided for all three of the last cargoes, the vessel shall be assumed to contain FAME greater than 5 vol %. The vessel tanks shall be evaluated and cleaned under the Minimum Requirements for Preparation of Tanker Cargo Tanks *table above* under procedures for Biodiesel Blends greater than B5 procedures. Alternatively, another vessel with FAME testing for the last three cargoes conducted may be nominated instead.

-- Tanks shall be in good condition and washing shall be particularly stringent, including flushing of pumps and lines, followed by drain and mop, at a minimum. A fresh- water rinse is required if sea water is used. Uncoated tanks shall be hot water washed and have loose bottom scale removed prior to loading an aviation fuel product cargo load.

-- Following cargoes with a FAME content of 5 vol % or less (B5 or below): Prior to loading Aviation Fuel Product cargoes, recommend a hot water wash, including flushing of the pumps and lines, followed by draining, at a minimum. A fresh-water rinse is required if sea water is used.

Special note:

Specifications for sensitive grades will require extreme care during sampling to avoid contamination from previous cargoes or buildup of residues. To reduce the possibility ofdrawing unrepresentative samples, cleaning of sampling equipment, vapor locks, standpipes and stilling wells is recommended as part of cleaning when tanks have previously held cargoes containing FAME.

6. Water soluble chemicals: include Ethanol, Mono Ethylene Glycol, Di Ethylene Glycol. See page four (4) for additional water soluble/miscible chemicals.
7. Previous automotive and aviation gasoline cargoes for loading JPTS are unacceptable unless the concentration of lead is verified to be less than 13ppm.
8. Certain products to be loaded on a tanker must not only consider the last cargo carried, but the 2nd and 3rd to last cargoes as well. These products include aviation turbine fuels and F-76 fuel oil, naval distillate. Previous cargoes of Crude oil and products containing FAME are addressed in notes 3 and 5. Other 2nd and 3rd to last cargoes of concerninclude, but are not limited to, raw vegetable oil, lubricating oils, heavy fuel oils, and various chemicals. Determinations for acceptability of 2nd and 3rd to last cargoes carried prior to loading aviation fuel and F-76 will be made on a case-by-case basis using applicable Certificates of Analysis, Certificates of Quality and other analytical data.
9. Cargos carrying dyed kerosene shall use the A/B cleaning procedure.

Table XVIII, Test Series Definition

TYPE	DESCRIPTION
A	Complete specification test as per specification detailed in the contract
B-1	A limited subset of principle characteristics of the type A full test specification requirement most likely to be affected by transportation of a product.
B-2	A more rigorous subset of the type A full test specification requirement than the type B-1 test schedule and aimed at those parameters susceptible to deterioration through aging, weathering, and long-term storage conditions.
B-3	Partial analysis for contamination; in particular, for controlling the re-injection of pipeline interface products.
Appearance	To confirm that no free water and/or visual solid particulate are present in the fuel and that the fuel has a “clear & bright” appearance at ambient temperature.
C	A limited number of tests performed to identify and compare product properties to ensure that no major changes have taken place during the fuel transfer process by any means of transport.
C+ (C-Plus)	C-test plus additional tests. These tests are to be performed to ensure that critical properties are fulfilled and/or additives are present at the correct concentration.