INCH-POUND

MIL-P-87107C
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SUPERSEDING
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1 MARCH 1979

MILITARY SPECIFICATION

PROPELLANT, HIGH DENSITY SYNTHETIC HYDROCARBON TYPE, GRADE JP-10

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers one grade of high density synthetic hydrocarbon type propellant.

1.2 Classification

GRADE	DESCRIPTION
JP-10	High density hydrocarbon fuel, composed solely of *exo*-tetrahydrodi(cyclopentadiene)

2. APPLICABLE DOCUMENTS

2.1 Government documents

2.1.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

MILITARY

MIL-I-27686 Inhibitor, Icing, Fuel System

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: ASD/ENES, Wright-Patterson AFB, OH 45433-6503, by using the self-addresssed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 9135

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

STANDARDS

FEDERAL

FED-STD-791 Lubricants, Liquid Fuel and Related Products, Methods of Testing

MILITARY

MIL-STD-290 Packing of Petroleum and Related Products

(Unless otherwise indicated, copies of military specifications and standards are available from the Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

2.1.2 Other Government documents. The following other Government documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those listed in the solicitation.

AFR 71-4	Preparing Hazardous Materials for Military Air Shipments
IATA	International Air Transport Association
ICAO	International Civil Aviation Organizations
	International Maritime Dangerous Goods Code

(Application for copies should be addressed to the Superintendent of Documents, US Government Printing Office, Washington DC 20402).

2.1.3 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 which 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).

American Society for Testing and Materials Standards

ASTM D 93	Tester, Closed, Flash Point by Pensky-Martens
ASTM D 156	Saybolt Color of Petroleum Products (Saybolt Chromometer Method)
ASTM D 240	Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter Test
ASTM D 381	Test of Existent Gum in Fuels by Jet Evaporation
ASTM D 445	Kinematic Viscosity of Transparent and Opaque Liquids (And The Calculation of Dynamic Viscosity)
ASTM D 1298	Density, Relative Density (Specific Gravity, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
ASTM D 1655	Aviation Turbine Fuels Standard Specification
ASTM D 2276	Particulate Contaminant in Aviation Turbine Fuels
ASTM D 2382	Heat of Combustion of Hydrocarbon Fuels by Bomb Calorimeter (High-Precision Methods)
ASTM D 2386	Freezing Point of Aviation Fuels, Test Method For
ASTM D 3241	Thermal Oxidation Stability of Aviation Turbine Fuels (JFTOT Procedure) Standard Test Methods For

ASTM D 3828 Test Method for Flash Point by Setaflash Closed Tester
ASTM D 4057 Standard Practice for Manual Sampling of Petroleum and Petroleum Products
ASTM D 4176 Free Water and Particulate Contamination in Distillate Fuels (Clear and Bright Pass/Fail Procedures)
ASTM E 29 Recommended Practices for Indicating Which Places of Figures are to Be Considered Significant In Specified Limiting Values

(Application for copies should be addressed to The American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA, 19103).

Department of Transportation

CFR Title 49, Parts 100-199 Department of Transportation Rules and Regulations of the Transportation of Explosives and Dangerous Articles

(Application for copies should be addressed to The Superintendent of Documents, U.S. Government Printing Office, Washington DC 20402.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.2 Order of precedence. In the event of conbflict 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. REQUIREMENTS

3.1 Materials. Except as otherwise specified herein, Grade JP-10 shall consist solely of exo-tetrahydrodi(cyclopentadiene).

3.1.1 Reclaimed materials. There is no exclusion to the use of recovered materials. Reclaimed materials shall be required to the maximum extent possible.

3.2 Chemical and physical requirements. The chemical and physical requirements of the finished fuel shall conform to those listed in table I. Requirements contained herein are not subject to corrections for test tolerances. If multiple determinations are made, results falling within any specified repeatability and reproducibility tolerances may be averaged. For rounding off of significant figures, ASTM E 29 shall apply to all tests required by this specification.

3.3 Additives. The additives listed shall be used in combination in amounts not to exceed those specified. The type and amount of each additive used shall be reported.

TABLE I. Chemical and physical requirements and test methods.

Property	Min	Max	ASTM Standards
Color, Saybolt	+25		D 156
Chemical Analysis, wt percent			1/
exo-tetrahydrodi(cyclopentadiene)	98.5	100.0	
other hydrocarbons		1.5	
Flash point, °C (°F)	54.4 (130)		D 93,D 3828
Specific gravity, (60/60F)	0.935	0.943	D 1298
Freezing point, °C (°F)		-79 (-110)	D 2386 2/
Viscosity, centistokes at °C (°F)			D 445
-54 (-65)		40	
-18 (0)		10	
Net heat of combustion			D 240,D2382
MJ/kg (Btu/lb)	42.1 (18,100)		
MJ/m (Btu/gallon	39,400 (141,500)		
Thermal stability			D 3241 3/
change in pressure drop, mm Hg		10	
heater tube deposit visual rating		code 2	
Existent gum, mg/100 mL		5.0	D 381
Particulate matter, mg/liter		1.0	D 2276
Fuel System Icing inhibitor, vol percent	0.10	0.15	4/

1/ Test procedure and required equipment outlined in Appendix A.

2/ This is for reference only, not a requirement.

3/ See 4.6.1.1 for D 3241 test conditions and test limits.

4/ Test shall be performed using method 5327 or 5342 of FED-STD-791.

3.3.1 Antioxidants. The following active inhibitors shall be blended separately or in combination into the fuel in total concentration of 90 parts per million (minimum) to 110 parts per million (maximum), by weight, not including weight of solvent, in order to prevent the formation of polymeric oxidation products:

a. 2,6-di-tert-butyl-4-methylphenol

b. 6-tert-butyl-2,4-dimethylphenol

c. 2,6-di-tert-butylphenol

3.3.2 Fuel system icing inhibitor. The fuel system icing inhibitor shall conform to MIL-I-27686.

3.4 Workmanship. The finished fuel blend shall be visually free from undissolved water, sediment or suspended matter and shall be clear and bright at the ambient temperature or at 21°C (70°F), whichever is higher. ASTM D 4176 describes a suitable test method for determining if the fuel is clear and bright.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and test) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Governments reserves the right to perform any of the inspections set forth in this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspections set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Classification of inspection. The inspection requirements specified herein are classified as quality conformance inspection (see 4.3)

4.3 Quality conformance inspections. For acceptance purposes, individual lots shall be examined as specified herein and subject to tests for all requirements cited in section 3.

4.3.1 Inspection lot

4.3.1.1 Bulk lot. A bulk lot shall consist of an indefinite quantity of a homogeneous mixture of material offered for acceptance in a single isolated container.

4.3.1.2 Packaged lot. A packaged lot shall consist of an indefinite number of 55-gallon drums or small unit packages of identical size and shape offered for acceptance and filled from the isolated tank containing a homogeneous mixture of material.

4.3.2 Sampling

4.3.2.1 Sampling for verification of product quality. Each bulk or packaged lot of material shall be sampled for verification of product quality in accordance with ASTM D 4057 except where individual test procedures contain specific sampling instructions.

4.3.2.2 Sampling for examination of filled containers for delivery. A random sample of filled containers shall be selected from each lot. The samples shall be examined in accordance with 4.5.3.

4.4 Inspection. Inspection shall be performed in accordance with method 9601 of FED-STD-791.

4.5 Examinations

4.5.1 Examination of products. Samples selected in accordance with 4.3.2.1 shall be visually examined for compliance with 3.4.

4.5.2 Examination of empty containers. Prior to filling, each empty unit container shall be visually inspected for cleanliness and suitability.

4.5.3 Examination of filled containers. Samples taken as specified in 4.3.2.2 shall be examined for conformance to MIL-STD-290 with regard to fill, closure, sealing, leakage, packaging, packing, and markings. Any container having one or more defects under the required fill shall be rejected.

4.6 Test methods. Tests to determine conformance to chemical and physical requirements shall be conducted in accordance with FED-STD-791, ASTM standards, or in the case of unique requirements, the test procedures as outlined in table I and described in the attached Appendices.

4.6.1 Thermal stability

4.6.1.1 ASTM D 3241. The thermal stability test shall be conducted using ASTM D 3241 (JFTOT). The heater tube shall be rated visually. (See Appendix B).

4.6.1.1.1 ASTM D 3241 test conditions

a. Heater tube temperature at maximum point: 300°C (572°F).

b. Fuel system pressure: 3.43 MPa (500 psig).

c. Fuel flow rate: 3.0 ml/minute.

d. Test duration: 150 minutes.

4.6.1.1.2 Results. The fuel sample is acceptable if all the following criteria are met:

a. The maximum visual rating of the heater tube deposits is less than a code 3 (Appendix B, 30.6).

b. The visual rating of the heater tube show neither peacock type deposit (code P) nor abnormal type deposits (code A) (Appendix B, 30.6.3.1 and 30.6.3.2).

c. The maximum differential pressure across the test filter does not exceed 10 millimeters of mercury.

4.6.1.1.3 ASTM D 3241 reported data. The following data shall be reported:

a. Differential pressure in millimeters of mercury at 150 minutes, or time to differential pressure of 10 millimeters of mercury, whichever comes first.

b. Heater tube deposit Visual rating Code at the end of the test.

4.7 Test-report. Test data required by 4.6 shall be reported in the same order as listed in Table I. The Inspection data on Aviation Turbine Fuels form published in ASTM D 1655 shall be used as a guide. Also, the types and concentration of additives used shall be reported (6.2.1).

5. PACKAGING

5.1 Packaging, packing, and marking. Packaging, packing, and marking shall be in accordance with MIL-STD-290. All fuel containers shall be marked with the actual flash point in degrees F of the fuel contained therein.

5.2 Transportation of fuels. The transportation of JP-10 fuel shall be in accordance with Code of Federal Regulations 49 (49 CFR), Parts 100-199; AFR 71-4, Preparing Hazardous Materials for Military Air Shipments; International Maritime Dangerous Goods Code; International Air Transport Association (IATA); and the International Civil Aviation Organizations (ICAO), as applicable for mode of transportation and destination.

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 fuel covered by this specification is intended for use in gas turbine engines or ramjet engines for missile application.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.

b. Quantity required and size containers desired.

c. Level of packaging and packing required (see 5.1).

d. When blocking and bracing is specified (see 5.2).

6.2.1 Contract data requirements. Data as required by 4.7 to be submitted as stated on DD 1423 and incorporated in the contract.

6.2.1.1 Type and amount of additive (3.3)

6.3 Precaution of mixing-inhibitors. To prevent any possible reaction between the concentrated forms of the different inhibitors (see 3.3) the fuel contractor is cautioned not to commingle inhibitors prior to their addition to the fuels.

6.4 Key words.

JP-10

Propellant

Synthetic hydrocarbon fuel

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

Custodians:
Air Force - 11
Navy - AS

Preparing activity:
Air Force - 11

Review activity:
Air Force - 68

Project 9135-0115

APPENDIX A

METHOD OF TEST FOR ANALYSIS OF GRADE JP-10 FUEL BY GAS CHROMATOGRAPHY

10. Scope. This method provides for the quantitative determination of the purity of exo-tetrahydrodi(cyclopentadiene), the single chemical structure of JP-10. For determining the purity of JP-10, the chromatograph shall be calibrated with a pure sample of exo-tetrahydrodi(cyclopentadiene) (see 40.5).

20. Summary of methods. The sample is introduced into a gas chromatographic column. The detector signal is monitored continuously and the areas of individual peaks are used for computing the quantities of the JP-10 and other hydrocarbon impurities. The detailed composition of the JP-10 component is computed from the individual peak areas in the subgroup.

30. Apparatus

30.1 Chromatograph. Any conventional gas chromatograph, having at least the following features, is acceptable.

30.1.1 Detector. Either a thermal conductivity (TCD) or flame ionization (FID) detector may be used. The detector shall be operated in such a manner that its linear dynamic range is not exceeded, and its linearity should be checked periodically. The detector shall be capable of continuous operational at 325°C or higher, and must be connected to the column in a manner that eliminates cold spots.

30.1.2 Temperature programmer. The instrument must be capable of reproducible temperature programming over the range of 50 to 300°C. The programming rate must be sufficiently reproducible that individual retention times do not vary by more than 2 percent. Any temperature program, including multilinear modes and intermediate periods of isothermal operation, is acceptable, provided that the column resolution, as defined in section 50.2, is not compromised.

Note 1. If capillary-type columns are used for the analysis, it may not be necessary to program the oven above 200°C.

30.1.3 Sample inlet system. Either flash vaporization or on-column injection may be used. For flash vaporization, the sample inlet port must be maintained between 300° and 350°C, and well-conditioned septa must be used. If on-column injection is employed, provision must be made for programming the temperature of the full length of the column. A sample inlet splitter may be used in conjunction with capillary columns, if care is taken to ensure that a representative sample is delivered to the column.

Note 2. New septa should be allowed to condition overnight after being installed in order to minimize spurious peaks, and several blank runs should be made to purge the column of materials bleeding from the septum. Overnight conditioning can be eliminated by the expedient of storing a supply of septa in the column oven. However, at least one blank run should still be made following each septum change.

30.1.4 Recorder. Any potentiometric recorder compatible with the chromatograph may be used. The full-scale response time should be two seconds or less, and the gain and damping controls should be adjusted to provide optimum response and minimum noise.

30.1.5 Column. Either packed or open-tubular (capillary-type) columns may be used, provided the minimum resolution, specified in section 50.2, is maintained. The column should be designed for maximum thermal stability nd minimum bleed, since the temperature program is likely to run as high as 275°C for packed columns and 200°C for capillary columns. Dual-column compensation is required if column bleed results in excessive baseline drift at high temperatures.

30.1.6 Integrating. An electric integrator is required for highest accuracy and precision. Data acquisition and reduction by an on-line computer, programmed for gas chromatograph, is convenient and may be used if such capability is available.

30.1.7 Microsyringe. A microsyringe, capable of delivering sample volumes from 0.5 to 5.0 microliters, is required.

Note 3. The widely used 0-10 microliter syringe, Hamilton Model 701N or its equivalent, is recommended. These syringes are routinely available from most instrument manufacturers and chromatography supply houses.

40. Reagents and materials

40.1 Stationary phase. The stationary phase should be one of the familiar non-polar silicone gum rubbers. The following silicones have been used successfully:

Silicon SE-30
Silicone UCW-98
Silicone OV-101

Note 4. UCW-98 is recommended because it exhibits less column bleed at high temperatures than the other silicones. However, any of the listed phases are satisfactory, provided baseline drift at high temperatures is minimized by conditioning or by dual column compensation.

40.2 Carrier gas. Either helium or nitrogen is suitable, although nitrogen is known to give somewhat higher column efficiencies at lower flow rates, and is more economical. Helium must be used with thermal conductivity detectors. The flow must be maintained constant to within one percent throughout the entire range of operating temperatures by means of constant flow controllers.

40.3 Hydrogen. High purity, for flame ionization detectors.

40.4 Air. Dry, Filtered, and oil-free, for flame ionization detectors.

40.5 exo-Tetrahydrodi(cyclopentadiene). (99 percent purity), hereafter referred to as C-10.

Note 5. A high purity sample of C-10 may be obtained by submitting a written request to AFWAL/POSF, Wright-Patterson AFB, OH 45433-6563.

40.6 n-Pentane, n-hexane, or carbon disulfide. Chromatographic purity.

40.7 Qualatitative calibration mixtures. A series of known hydrocarbons is used for calculating column resolution. Prepare a mixture containing about one percent (by volume) each, in pentane or hexane, of at least eight normal alkanes from highly pure (minimum 99 percent) samples which have boiling points in the 70°C to 250°C range. The mixture must contain n-dodecane and n-tetradecane.

50. Preparation of apparatus

50.1 Column. Any conventional method of conditioning and installing the column is satisfactory, provided the system is free of gas leaks and the column resolution meets the minimum requirement specified in section 50.2

50.2 Column resolution. Run a sample of the qualitative calibration mixture and measure the retention times and widths of the n-dodecane and n-tetradecane peaks as shown in figure A1. Resolution is defined as the difference in retention times for $n\text{-}C_{12}$ and $n\text{-}C_{14}$ divided by their average width:

$$R = \frac{2\ (RT_{14} - RT_{12})}{W_{14} + W_{12}}$$

Resolution determined in this way must be at least 5.0 and can be optimized by varying the temperature program and the carrier flow rate. If resolution cannot be increased to at least 5.0 by optimizing these parameters, it is necessary to use a difference column.

50.3 Chromatograph. Place in service according to the manfacturer's specifications paying particular attention to flow rates through the detector.

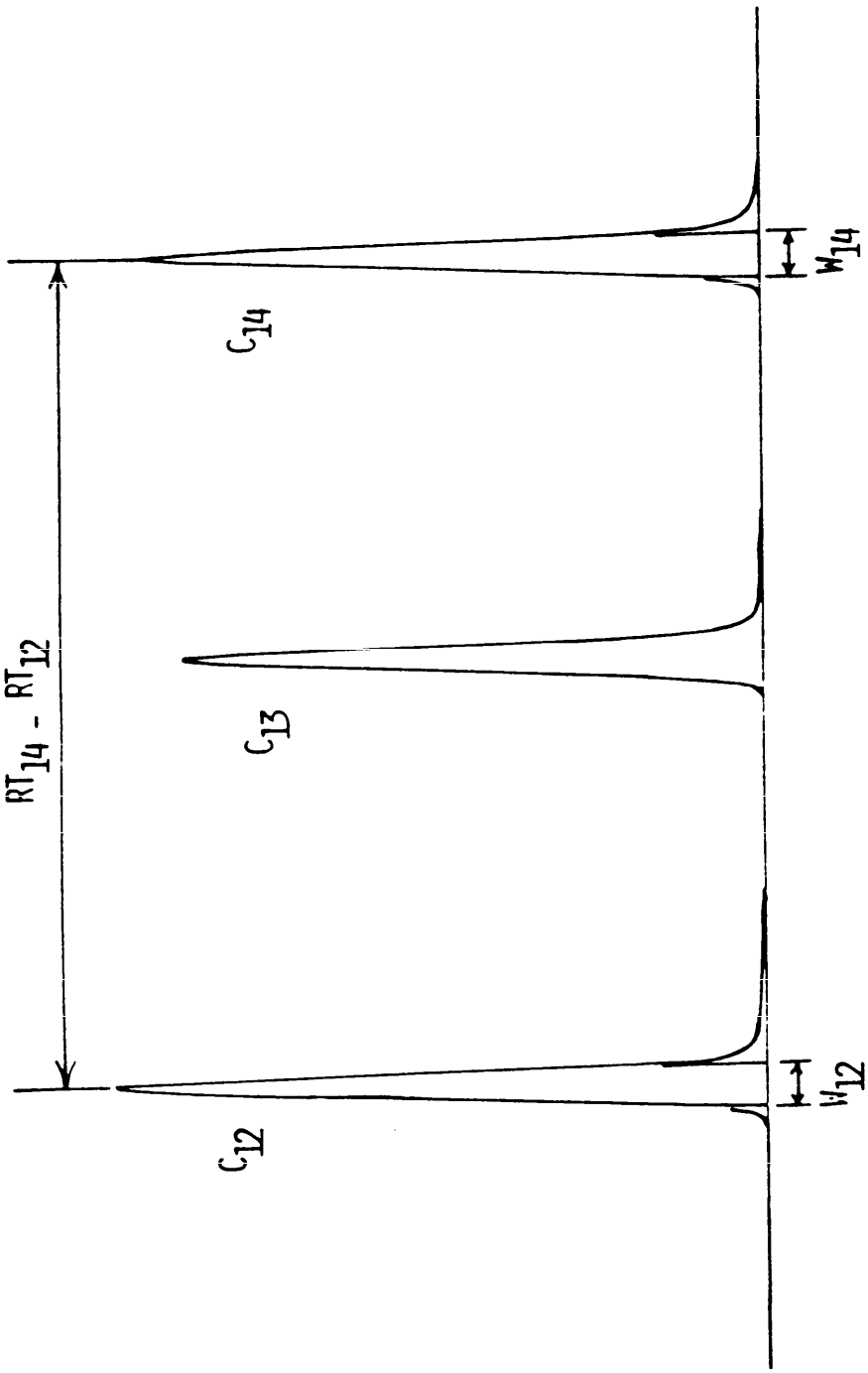

FIGURE A1. Calculation of column resolution.

60. Procedure

60.1 Establish a suitable sample volume by making several trial runs with the qualitative calibration mixture. For FID instruments, the volume may be between 0.5 and 1.0 microliter: for TCD instruments, volumes from 1.0 to 5.0 microliters have been found satisfactory.

60.2 Dilute an aliquot of the JP-10 acceptance sample at least 1:10 (preferably 1:20) with either pentane, hexane, or carbon disulfide. Mix thoroughly and inject a measured volume into the chromatograph, simultaneously activating the temperature program, the integrator, and the recorder.

60.3 Integrate the area under the chromatogram continuously until the final peak has been eluted.

Note 6. For C-10 extra peaks which are within plus or minus ten percent of the retention time for C-10 shall be considered part of the C-10 peak if they do not contribute more than 20 percent to the total C-10 peak areas.

70. Calculations

70.1 For each JP-10 acceptance sample, calculate the weight percent of C-10 as follows:

$$\%C\text{-}10 = \frac{A_{C\text{-}10}}{A_{C\text{-}10} + A_{impurities}} \times 100$$

In the above equation, all hydrocarbons other than those contained in the C-10 subgroup are considered impurities. A response factor of 1.000 is used for the impurities.

80. Precisions. Detailed precision studies have not been performed for this method. However, limited results indicate that the method is capable of the following precision.

80.1 Repeatability. Replicate analyses, performed under identical conditions in the same laboratory, should yield results that do not vary more than one percent (absolute) from the mean value for each component.

80.2 Reproducibility. When the same sample is analyzed in different laboratories according to this method, the results for any component should not differ by more than 1.5 percent (absolute).

80.3 Accuracy. Back-analysis of a calibration standard should give results that agree with the known values to within 0.5 percent (absolute).

APPENDIX B

HEATER TUBE DEPOSIT RATING

10. SCOPE

10.1 Scope. This appendix provides instructions for conducting and reading the heat tube deposit. This appendix is a mandatory part of the specification.

20. REFERENCED DOCUMENTS. This section is not applicable to this appendix.

30. VISUAL TEST METHOD

30.1 Snap the upper end of the heater tube into the clamp of the adapter for the heater tube.

30.2 Push the heater tube against the stop of the adapter tube.

30.3 Slide the adapter with the heater tube over the guide rod into the tuberator equipped with a magnifying glass assembly.

30.4 Insert the ASTM color standard into the tuberator.

30.5 Rotate the adapter and position the heater tube so that the side with the maximum deposit is visible.

30.6 Within 30 minutes after completion of the test, visually examine the heater tube in a tuberator. The entire portion of the test section between the bottom shoulder and the top shoulder of the heater tube test section shall be carefully examined using a magnifying lass in conjunction with the tuberator for any signs of discoloration, scratches, or other visually identified defects. When an area of the tube corresponds visually to an ASTM color standard, that color standard code number shall be recorded. If the area being rated has a color between two adjacent color standards, it shall be rated as the lighter (that is the lower number) color standard. (NOTE: It is important that all light bulbs in the tuberator are functioning as a change in light intensity can shift the rating significantly.) (NOTE: The person rating the tube should have normal ability to distinguish between colors; i.e., he should not be color blind.)

30.6.1 In rating the heater tube, the darkest deposits govern and the code number representative of the darkest section, rather than the average deposit, shall be reported.

30.6.2 If a spot or streak is found on the heater tube, it shall be carefully examined under various lighting conditions using a magnifying lass to determine if it is a deposit, a scratch, or tube defect (note that the tube defects should have been found during the pretest inspection of the tube). If the spot or streak is determined to be a scratch or tube defect, it shall be disregarded. If the spot or streak is a deposit, it shall be rated against the ASTM color standards, if larger in area than about 0.004 square inch (0.025 sq cm): i.e., approximately 1/16 inch x 1/16 inch (1.5 mm x 1.5 mm) square or an equivalent area. However, a streak deposit shall be ignored if less than 1/32 inch (0.8 mm) wide, regardless of length. Note that the tube section is 1/8 inch (about 3 mm) in diameter: thus a 1/16 inch (1.5 mm) wide spot is half the diameter of the tube test section and 1/32 inch (0.8 mm) wide streak is one fourth the diameter of the tube test section.

30.6.3 If the heater tube has deposits which do not match the Color Standards, the following criteria shall be used:

30.6.3.1 If the deposit has peacock (rainbow) colors, rate this as code P (P for peacock). If some portion of the deposit does match the Color Standard, it shall be rated.

30.6.3.2 Deposits having abnormal colors (for example, blue or gray) shall have rating of code A (A for abnormal color) assigned.

30.6.3.3 When reporting the overall tube rating, record the rating of the maximum deposit which matches the Color Standards plus P or A if the tube contains deposits which do not match the Color Standards. If the tube contains only P or A deposits, just report the appropriate letter(s); do not try to assign a numerical rating to a P or A deposit. Examples of how the rating procedure is to be used are given below:

Example 1: The darkest deposits on the heater tube match color Standard 3. Also present are peacock colors. Thus, the overall tube rating to be reported is 3P.

Example 2: The heater tube has maximum deposits falling between Color Standards 2 and 3 and has no peacock or abnormal colors. The total tube rating is 2.

Example 3: The heater tube matches Color Standards 1 except for abnormal deposits which does not match the ASTM Color Standards. The overall tube rating to be reported is 1A.

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-P-87107C	Propellant, High Density Synthetic Hydrocarbon Type, Grade JP-10

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR ☐ USER ☐ MANUFACTURER ☐ OTHER *(Specify)*:
b. ADDRESS *(Street, City, State, ZIP Code)*	

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

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