

INCH-POUND

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SUPERSEDING

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1 November 2013

COMMERCIAL ITEM DESCRIPTION

Petroleum Distillation Test Apparatus

The General Services Administration has authorized the use of this commercial item description for all federal agencies.

1. **SCOPE.** This Commercial Item Description (CID), describes a Petroleum Distillation Test Apparatus that performs ASTM-D86 testing (Distillation of Petroleum Products at Atmospheric Pressure). The petroleum distillation test apparatus is used to determine a fuel's tendency to vaporize. Distillation is a method of separating mixtures based on differences in volatility of components in a boiling liquid mixture. Distillation is a unit operation, or a physical separation process, and not a chemical reaction.

2. **SALIENT CHARACTERISTICS.**

2.1 **Equipment.** The distillation test unit shall be capable of measuring the distillation characteristics of fuels such as diesel, gasoline, jet fuel, and other solvents in correlation with ASTM-D86. The basic components of the distillation unit are the distillation flask, the condenser and associated cooling bath, a metal shield or enclosure for the distillation flask, the heat source, the flask support, the temperature measuring device, and the receiving cylinder to collect the distillate. The unit should also be portable, self-contained, and have computer connection capability. The characteristics described in this section are the minimum requirements necessary for this tester.

2.2 **Standard Test Method.** The distillation test apparatus shall perform in accordance to ASTM-D86. ASTM-D86 is a test method which covers the atmospheric distillation of petroleum products using a laboratory batch distillation unit to determine quantitatively the boiling range characteristics of such products as natural gasolines, light and middle distillates, automotive spark-ignition engine fuels, aviation gasolines, aviation turbine fuels, 1-D and 2-D regular and low sulfur diesel fuels, special petroleum spirits, naphthas, white spirits, kerosines, and Grades 1 and 2 burner fuels. The test method is designed for the analysis of distillate fuels.

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2.3 Sample Distillation Temperature Measurement Range. The sample temperature test range for measuring the vapor temperature of the liquid is from 0° to 400°C (32° to 752°F).

2.4 Apparatus. The apparatus shall conform to the testing outlined in ASTM-D86. The apparatus shall consist of a flask or cup, receiver, vapor probe, heating element, connective tubing, and cleaner.

2.4.1 Flask or Cup. The glass flask or metal cup should be manufactured from non-corrosive material and follow the dimensions specified in ASTM-D86.

2.4.2 Receiver. The receiver shall be able to contain the sample volume and also be manufactured from non-corrosive material.

2.4.3 Vapor Probe. The vapor probe should consist of a thermoelectric sensor composed of NiCr or other suitable alloy to measure the vapor temperature.

2.4.4 Heating Element. The heating element should consist of heating plates or an internal heating element that will safely heat the sample to the desired temperature.

2.4.5 Connective Tubing. The connective tubing that connects the flask with the other components of the apparatus should be made of a material that will not break down upon contact with the hot vapor.

2.4.6 Cleaner. The machine must come with condenser cleaner to manually clean the machine or some other method of automatically cleaning the machine after tests have been performed to prevent contamination. Acetone is typically used in the cleaning procedure, but other suitable cleaners may be used as well.

2.5 Safety. If the test apparatus uses glass flasks it should come with a built in fire suppression system in case the glass flask breaks. In accordance with ASTM-D86, automated equipment manufactured in 1999 and later shall be equipped with a device to automatically shut down power to the unit and to spray an inert gas or vapor in the chamber where the distillation flask is mounted in the event of fire. Some causes of fires are breakage of the distillation flask, electrical shorts, and foaming and spilling of liquid sample thorough the top opening of the flask.

2.6 Calibration. The unit shall be able to measure and display temperatures in Fahrenheit or Celsius and use English as the communication language.

2.7 Data Storage. The apparatus must be able to store data from the test results and transferring it to a computer.

2.8 Tester Size. The unit shall weigh less than 165 lbs. Dimension shall be no more than 22 inches Width X 30 inches Depth X 36 inches Height.

2.9 Power Requirements. Unit shall run on standard 115V and 220V electrical outlets, 50 and 60 Hz.

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2.10 Diagnostic Fault Testing. The unit shall perform diagnostic fault testing to identify faulty conditions. The diagnostic fault testing accessory shall perform diagnostic tests by plugging into port, checking at least the following: fuses, heating elements, fans, cooling unit, pumps, and voltage checks. Diagnostic fault testing must be accomplished without opening the unit.

3. REGULATORY REQUIREMENTS.

3.1 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs. The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with 23.403 of the Federal Acquisition Regulation (FAR). However, used, rebuilt, or refurbished items shall not be provided.

3.2 Green Procurement Program. Green Procurement Program (GPP) is a mandatory federal acquisition program that focuses on the purchase and use of environmentally preferable products and services. GPP requirements apply to all acquisitions using appropriated funds, including services and new requirements. FAR 23.404(b) applies and states the GPP requires 100% of EPA designated product purchase that are included in the Comprehensive Procurement Guidelines list that contains recovered materials, unless the item cannot be acquired: a) competitively within a reasonable timeframe; b) meet appropriate performance standards, or c) at a reasonable price. The prime contractor is responsible for ensuring that all subcontractors comply with this requirement.

4. PRODUCT CONFORMANCE PROVISIONS

4.1 Product Conformance. The products provided shall conform to the producer's own drawings, specifications, standards, and quality assurance practices and be the same product offered for sale in the commercial market. The government reserves the right to require proof of such conformance. Minor changes to the commercial product, with respect to ruggedizing and environmental suitability and protection shall be permitted, subject to the approval of the procurement office, to satisfy the requirements of this requirement.

4.2 Serviceability, Reliability, and Quality of Materials.

4.2.1 Warranty. All supplied items shall carry a standard commercial warranty on parts and labor.

5. PACKAGING.

5.1 Preservation, packing, and marking shall be as specified in the contract or order.

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6. NOTES.

6.1 Source of documents.

6.1.1 ASTM documents may be obtained at at www.astm.org or from ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken PA 19428-2959.

6.1.2 FAR. FAR may be obtained from the Superintendent of Documents, P.O. Box 371954, Pittsburgh PA 15250-7954. Electronic copies of the FAR may be obtained from <https://www.acquisition.gov/far/>.

6.2 Key Words.

Atmospheric Pressure
Diesel
Gasoline
Jet fuel
Vaporize

Custodian:
Air Force - 84

Preparing activity:
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Reviewer:
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Agent:
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