NOT MEASUREMENT SENSITIVE

A-A-59693
September 7, 2001

COMMERCIAL ITEM DESCRIPTION

DIESEL FUEL, BIODIESEL BLEND (B20)

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

1. SCOPE. This commercial item description (CID) covers a biodiesel fuel blend containing 20 percent (%) biodiesel, with the remainder being low-sulfur diesel fuel oil. This fuel blend, hereafter referred to as B20, is intended for use in all non-tactical diesel fuel-consuming vehicles and equipment systems (see 6.5).

2. SALIENT CHARACTERISTICS.

2.1 Material. The B20 shall consist of biodiesel (see 6.3.1) conforming to the requirements of table I, with a cloud point as specified in 2.1.1, and diesel fuel oil conforming to A-A-52557 or ASTM D 975. The amount of biodiesel shall be 20 ± 1% by volume. The remainder of the fuel blend shall be Grade Low Sulfur No. 1-D diesel fuel oil (see 6.3.2), Grade Low Sulfur No. 2-D diesel fuel oil (see 6.3.3), or a combination of Grade No. 1-D and Grade No. 2-D.

2.1.1 Biodiesel cloud point. The cloud point of the biodiesel used in the formulation of the B20 shall be a maximum of 4.4 degrees Celsius (°C) when tested in accordance with (IAW) ASTM D 2500.

2.2 Performance requirements.

2.2.1 Low temperature properties. The low temperature performance of the B20 shall be defined by one of the following two properties: cloud point or cold filter plugging point (CFPP). When specified (see 6.2), the maximum cloud point of the B20 shall be equal to or lower than the tenth percentile minimum ambient temperature in the geographical area and seasonal timeframe in which the B20 is to be used, when tested IAW ASTM D 2500. When specified (see 6.2), the maximum CFPP of the B20 shall be a minimum of 10°C below the tenth percentile minimum ambient temperature in the geographical area and seasonal timeframe in which the B20 is to be used, when tested IAW ASTM D 6371 (see 6.4).

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data which may improve this document should be sent to: U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E/AEIT, Warren, MI 48397-5000.

AMSC N/A FSC 9140

TABLE I. Requirements for biodiesel (B100). 1/

Property	ASTM Test Method 2/	Limits
Flash point	D 93	130.0°C min
Water and sediment	D 2709	0.050 % volume max
Kinematic viscosity, 40°C 3/	D 445	1.9 – 6.0 mm^2/s
Sulfated ash	D 874	0.020 % mass max
Sulfur 4/	D 5453	0.05 % mass max
Copper strip corrosion	D 130	No. 3 max
Cetane number	D 613	47 min
Cloud point 5/	D 2500	Report
Carbon residue 6/	D 4530	0.050 % mass max
Acid number	D 664	0.80 mg KOH/g max
Free glycerin	D 6584	0.020 % mass max
Total glycerin	D 6584	0.240 % mass max
Phosphorus content	D 4951	0.001 % mass max
Distillation temperature, atmospheric equivalent temperature, 90% recovered	D 1160	360°C max

1/ To meet special operating conditions, modifications of individual limiting requirements may be agreed upon between purchaser, seller and manufacturer.
2/ The test methods indicated are the approved referee methods.
3/ The upper viscosity limit is higher than petrodiesel and should be taken into consideration when blending.
4/ Other sulfur limits can apply in selected areas in the United States and in other countries.
5/ The cloud point of biodiesel is generally higher than petrodiesel and should be taken into consideration when blending.
6/ Carbon residue shall be run on the 100% sample.

2.2.2 Free water. The free water of the B20 shall not exceed 0.05% by volume when tested IAW ASTM D 2709.

2.2.3 Particulates. The particulate contamination of the B20 shall not exceed 10 milligrams per liter (mg/L) when tested IAW ASTM D 6217.

2.2.4 Acid number. The acid number of the B20 shall be less than 0.25 milligrams of potassium hydroxide per gram of fuel sample (mg KOH/g) when tested IAW ASTM D 664 (see 6.5.2).

2.3 Fuel clarity. The B20 shall be visually free from undissolved water, sediment and suspended matter when tested IAW ASTM D 4176, Procedure 1.

3. REGULATORY REQUIREMENTS. The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, IAW paragraph 23.403 of the Federal Acquisition Regulation (FAR).

3.1 Clean Air Act requirements. Under authority of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) issues limits on the maximum sulfur level, the maximum aromatic content or minimum cetane index on diesel intended for on-road use. Details of the EPA regulations and test methods are given in Part 80 of Title 40 of the Code of Federal Regulations (40 CFR 80). Specifics may be obtained by contacting the Air Quality Office of the state environmental office or headquarters.

3.2 Legal requirements. B20 furnished under this description shall meet all applicable legal requirements IAW 40 CFR 80.

4. PRODUCT CONFORMANCE. The products provided shall meet the salient characteristics of this CID, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial marketplace. The Government reserves the right to require proof of such conformance.

5. PACKAGING. Preservation, packing, and marking shall be as specified in the contract or order (see 6.2).

6. NOTES.

6.1 Addresses for obtaining copies of referenced documents.

6.1.1 Copies of 40 CFR 80 are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, or via the GPO website at http://www.access.gpo.gov/nara/cfr/index.html/.

6.1.2 Copies of A-A-52557 "Fuel Oil, Diesel; for Posts, Camps and Stations" are available from the Document Automation and Production Service, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094. Electronic copies (in Adobe Acrobat .pdf format) can be downloaded free of charge from the Assist Online website at http://astimage.daps.dla.mil/online/.

6.1.3 Copies of ASTM D 93 "Standard Test Methods for Flash-Point by Pensky-Martens Closed Cup Tester", ASTM D 130 "Standard Test Method for Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test", ASTM D 445 "Standard Test Method for

Kinematic Viscosity of Transparent and Opaque Liquids (the Calculation of Dynamic Viscosity)", ASTM D 613 "Standard Test Method for Cetane Number of Diesel Fuel Oil", ASTM D 664 "Standard Test Method for Acid Number of Petroleum Products by Potentiometric Titration", ASTM D 874 "Standard Test Method for Sulfated Ash from Lubricating Oils and Additives", ASTM D 975 "Standard Specification for Diesel Fuel Oils", ASTM D 1160 "Standard Test Method for Distillation of Petroleum Products at Reduced Pressure", ASTM D 2500 "Standard Test Method for Cloud Point of Petroleum Products", ASTM D 2709 "Standard Test Method for Water and Sediment in Middle Distillate Fuels by Centrifuge", ASTM D 4176 "Standard Test Method for Free Water and Particulate Contamination in Distillate Fuels (Visual Inspection Procedures)", ASTM D 4530 "Standard Test Method for Determination of Carbon Residue (Micro Method)", ASTM D 4865 "Standard Guide for Generation and Dissipation of Static Electricity in Petroleum Fuel Systems", ASTM D 4951 "Standard Test Method for Determination of Additive Elements in Lubricating Oils by Inductively Coupled Plasma Atomic Emission Spectrometry", ASTM D 5453 "Standard Test Method for Determination of Total Sulfur in Light Hydrocarbons, Motor Fuels and Oils by Ultraviolet Fluorescence", ASTM D 6217 "Standard Test Method for Particulate Contamination in Middle Distillate Fuels by Laboratory Filtration", ASTM D 6371 "Standard Test Method for Cold Filter Plugging Point of Diesel and Heating Fuels", and ASTM D 6584 "Test Method for Determination of Free and Total Glycerine in B-100 Biodiesel Methyl Esters By Gas Chromatography" can be obtained from the American Society of Testing and Materials (ASTM) at 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, or via the ASTM website at http://www.astm.org/.

6.1.4 Copies of SAE Paper No. 1999-01-3520 "Potential Analytical Methods for Stability Testing of Biodiesel and Biodiesel Blends" can be obtained from the Society of Automotive Engineers (SAE) at 400 Commonwealth Drive, Warrendale, PA 15096-0001, or via the SAE website at http://www.sae.org/.

6.2 Ordering data. The contract or order should specify the following:

a. CID document number and revision.
b. Product conformance provisions.
c. Cloud point or CFPP required.
d. Quantity in terms of gallons or barrels bulk or number and size of containers for packaged lots.
e. Selection of applicable packaging or delivery requirements.

6.3 Definitions.

6.3.1 Biodiesel. A fuel composed of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, designated B100.

6.3.2 Grade Low Sulfur No. 1-D. A special-purpose, light distillate fuel used for automotive diesel and gas turbine engines requiring low sulfur fuel and requiring a higher volatility than that provided by Grade Low Sulfur No. 2-D.

6.3.3 Grade Low Sulfur No. 2-D. A general-purpose, middle distillate fuel used for automotive diesel and gas turbine engines requiring low sulfur fuel. It is also suitable for use in non-automotive application, especially in conditions of varying speed and load.

6.4 Minimum ambient temperatures. Tenth percentile minimum ambient temperatures for locations within the United States are provided in Appendix X4 of ASTM D 975 and may be used as a means of estimating expected regional temperatures.

6.5 Limitations for B20 usage.

6.5.1 Vehicles and equipment. B20 has not been approved for use in Army combat and tactical vehicles and equipment at this time. The different types of engine systems and engine compartment configurations, modes of operation, environmental conditions, storage stability concerns (see 6.5.2), solvency effects (see 6.6), and fuel interchangeability issues associated with the single fuel forward policy will necessitate field testing to fully validate the use of B20 in combat and tactical vehicles and equipment.

6.5.2 Storage life. Available data indicates that the B20 in vehicles or storage tanks should be used within six months of manufacture. Fuels that have an acid number equal to or over 0.25 mg KOH/g are not recommended for use.

6.6 Solvency properties of biodiesel. Biodiesel (B100) is a good solvent. Use of B20 may clean the fueling system of existing deposits. Users should be prepared to change fuel filters more frequently upon initial use.

6.7 Viscosity and distillation properties of B20 blended with Grade No. 1-D diesel fuel oil. The user must be aware that B20 using Grade Low Sulfur No. 1-D diesel fuel oil as base fuel may exceed the maximum viscosity and the maximum 90% recovered temperature requirements for Grade Low Sulfur No. 1-D diesel fuel oil IAW A-A-52557 and ASTM D 975. The significance of this deviation has not been established.

6.8 Static electricity. The generation of static electricity can create problems in the handling of distillate fuel oils with which biodiesel may be blended. For more information on the subject, see ASTM D 4865.

6.9 Original Equipment Manufacturers (OEM) biodiesel allowances. The impact of biodiesel use on warranty coverage, which varies by vehicle/engine manufacturers, has been checked. Major engine manufacturers have all issued statements regarding the use of biodiesel as it pertains to their warranty coverage. Copies of any of these statements can be obtained from the National Biodiesel Board (NBB) by calling (800) 841-5849 or faxing (573) 635-7913, or via the NBB website at http://www.biodiesel.org/.

6.10 Benefits of using biodiesel. The Energy Conservation Reauthorization Act (ECRA) of 1998, an amendment to the Energy Policy Act (EPACT) of 1992, permits Federal Agencies to use biodiesel to meet a portion of their alternative fueled vehicle (AFV) acquisition requirements. Section 312 (Biodiesel Fuel Use Credits) of ECRA permits Federal Agencies to

meet up to 50% of their AFV acquisition requirements by using biodiesel fuel. Under the new provisions, each 450 gallons of pure biodiesel (B100) used in a vehicle weighing over 8500 pounds counts as one full AFV credit. Since biodiesel is typically used as B20, using 2250 gallons of B20 equates to one AFV credit under EPACT.

6.11 Key words.

Blend
Compression ignition engine
Diesel consuming equipment
Low sulfur

MILITARY INTERESTS:

Custodians:
Army - AT
Navy - SH
Air Force - 68

Review Activities:
Army - AR, MI
Navy - EC, MC, SA
Air Force - 03
DLA - PS

CIVIL AGENCY COORDINATION ACTIVITIES:
GSA/FSS - 6FET
HHS - FEC, NIH
DOT - NHT

Preparing Activity:
Army - AT

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