

METRIC

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 SUPERSEDING
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COMMERCIAL ITEM DESCRIPTION

LUBRICATING OIL, AUTOMOTIVE ENGINE, API SERVICE SG

The General Services Administration has authorized the use of this commercial item description in preference to MIL-L-46152.

Abstract. This lubricating oil is intended for use in administrative type commercial vehicles equipped with spark-ignition gasoline consuming engines.

Salient characteristics. The engine lubricants shall have an "SG" API performance level as identified in SAE J183, carry the American Petroleum Institute (API) donut symbol with the Energy Conserving II performance requirement (except the 15W-40) as defined by SAE J1423, and meet the requirements specified herein. The lubricating oils shall have all the characteristics indicated when tested in accordance with the respective test method (ASTM test procedures are listed where applicable).

Viscosity grade. The engine lubricants shall be of the following SAE grades:

SAE 5W-30
 SAE 10W-30
 SAE 15W-40

Materials. The engine lubricating oils shall be derived from petroleum fractions, synthetically compounds, or a combination of the two types of products. They may be virgin or re-refined stocks or a combination thereof. The stocks shall be compounded with such functional additives (detergents, dispersants, oxidation inhibitor, corrosion inhibitors, etc.) as necessary to meet the specified requirements. No carcinogenic or potentially carcinogenic constituents, as defined under the Hazard Communication Standard (29 CFR 1910.1200), shall be present. The contractor shall provide certification to this effect to the contracting officer or the contracting officer's designated representative.

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and other data which may improve this document should be sent by letter to: Commander, US Army Belvoir Research, Development, and Engineering Center, ATTN: STRBE-TSE, Fort Belvoir, VA 22060-5606.

AMSC N/A

FSC 9150

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Formulation data. The contractor shall provide the name, type, percent, and manufacturer of all base stocks and additive packages for each formulation to be supplied. This information shall be provided to the contracting officer at the time of solicitation.

Foaming. The foam tendencies and stability of all grades shall not exceed the following values when tested in accordance with ASTM D 892.

	Foaming Tendencies	Foam Stability 5 min. Settling
At 25 °C, mL	10	0
At 93 °C, mL	50	0
At 25 °C, mL	10	0

Stability and compatibility. The oils shall show no evidence of separation or color change when they are tested in accordance with FED-STD-791, method 3470 and using designated reference oils as required by the test. Reference oils can be obtained from SAE.

Shear stability. Oils shall stay within the designated grade when tested by the following method:

- a. Weigh 25 grams of used oil, obtained at 10 hours of testing in accordance with Labeco L-38 test method, into a 50-mL three-necked, round bottom flask equipped with a thermometer, gas inlet tube, stirrer, and distillation side arm.
- b. Heat the sample at 120 ± 5 °C in a vacuum of 100 mm of mercury with a nitrogen sparge for one hour.
- c. Filter the stripped sample through a 0.5 micron filter pad.
- d. Determine the kinematic viscosity at 100 °C of the filtered sample using ASTM D 445. Check the resulting viscosity for conformance to the viscosity limits indicated previously in this document.

Physical and chemical requirements. The lubricant shall meet the following salient physical and chemical properties:

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Property	SAE Grade			Test Procedure
	5W-30	10W-30	15W-40	
Viscosity Kinematic, cSt				ASTM D 445
at 100 °C min.	9.3	9.3	12.5	
max.	<12.5	<12.5	<16.3	
at 40 °C	<u>1/</u>	<u>1/</u>	<u>1/</u>	
Apparent viscosity @ <u>2/</u> temperature, cP @ °C				SAE J300, appendix A
min.	32500-30	35000-25	35000-20	
max.	35000-25	35000-20	35000-15	
High temperature/high shear viscosity, mPa*s, min.	2.9	2.9	3.7	ASTM D 4624, D 4683, D 4741
Pumpability, 30,000 cP max. at temperature, °C	-30	-25	-20	ASTM D 4684
Viscosity index	<u>1/</u>	<u>1/</u>	<u>1/</u>	ASTM D 2270
Pour-point, °C, max.	-35	-30	-23	ASTM D 97
Stable pour point, °C, max. <u>3/</u>	-35	-30	-23	FED-STO-791, method 203
Flash point, °C, min.	200	205	215	ASTM D 92
Evaporative loss, %, max	20	17	15	ASTM D 2887
Phosphorus, mass %, max.	0.12	0.12	<u>1/</u>	ASTM D 1091, D 4047, D 5185
Gravity, °API	<u>1/</u>	<u>1/</u>	<u>1/</u>	ASTM D 287
Carbon residue, mass %	<u>1/</u>	<u>1/</u>	<u>1/</u>	ASTM D 524
Sulfur, mass %	<u>1/</u>	<u>1/</u>	<u>1/</u>	ASTM D 2622, D 4927, D 4951, D 5185
Sulfated ash, mass %	<u>1/</u>	<u>1/</u>	<u>1/</u>	ASTM D 874
Total acid number	<u>1/</u>	<u>1/</u>	<u>1/</u>	ASTM D 664
Base number	<u>1/</u>	<u>1/</u>	<u>1/</u>	ASTM D 2896
Nitrogen	<u>1/</u>	<u>1/</u>	<u>1/</u>	ASTM D 3228
Metallic components, mass %	<u>1/</u>	<u>1/</u>	<u>1/</u>	ASTM D 4297, D 4628, D 4951, D 5185

- 1/ Typical values are to be provided. In addition, the tolerance and control standards employed to monitor product quality during manufacture shall be provided for each lubricant formulation.
- 2/ Report measured apparent viscosity at the minimum and maximum temperature.
- 3/ After being cooled below its pour-point, the oil shall regain its homogeneity on standing at a temperature not more than 6 °C above the pour point, but not to exceed the above stated values.

Toxicity. The engine lubricating oil shall have no adverse effect on the health of personnel when used for its intended purpose. Questions pertinent to this effect shall be referred by the contracting activity to the appropriate departmental medical service who will act as an advisor to the contracting agency. The contractor shall have the toxicological formulations and associate information available for review by the contracting activity to evaluate the safety of the material for proposed use.

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Contractor certification. The contractor shall certify and maintain substantiating evidence, that the product offered meets the salient characteristics of this commercial item description, and that the product conforms to the producer's own drawings, specifications, standards, and quality assurance practices. The Government reserves the right to require proof of such performance prior to delivery and thereafter as may be otherwise provided for under the provisions of the contract. The contractor shall provide the results of physical and chemical properties at the time of solicitation along with the information required under "formulation data" above. The contractor shall provide summary of performance data, consisting of test reports, substantiating that the product to be supplied meets the SAE specifications cited under "salient characteristics" and "physical and chemical requirements" above.

Material Safety Data Sheets. A Material Safety Data Sheet shall be prepared for each lubricating oil by viscosity grade in accordance with FED-STD-313 and be included with each shipment of the material covered by this document and submitted to the pertinent Government agencies as stated in FED-STD-313.

Preservation, packaging, packing, labeling and marking. Preservation, packaging, labeling and marking shall be as specified in the contract or order. The container shall be as specified in the contract or order.

Inspection and test. The inspection and testing of products shall be as specified in the contract or order.

National stock numbers (NSN). The following NSN's are for use by the Government and does not constitute a requirement on the contractor, unless required by the contract or order. The lubricating oils provided can be ordered using the following NSN's:

National Stock Number	SAE Viscosity Grade	Container Size
9150-01-320-3706 9150-01-348-1596	5W-30	1 quart bottle 55 gallon drum
9150-01-227-8210 9150-01-230-9749 9150-02-230-9748	10W-30	1 quart bottle 5 gallon can 55 gallon drum
9150-01-227-8211 9150-01-230-9750 9150-01-230-9751	15W-40	1 quart bottle 5 gallon can 55 gallon drum

Notes. The procuring agency should specify the preferred options permitted herein and include the following information in procurement documents:

1. Title, number, and date of this item description.
2. SAE grade of oil required.
3. Quantity of oil required.
4. Type and size on containers required.
5. When this commercial item description is used for procurement, the certification clause must appear in the solicitation.

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6. When this commercial item description is used for procurement, the inspection and test clause must appear in the solicitation.

References:

FED-STD-313 and FED-STD-791 are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

29 CFR 1910.1200 is available from the Superintendent of Documents, Government Printing Office, Washington, DC 20402.

The API Engine Service Classification System licensees list can be obtained from American Petroleum Institute, Marketing Department, Program Manager, ESCS Program, 1220 L Street N.W., Washington, D.C. 20005.

ASTM D 92, D 97, D 287, D 445, D 524, D 664, D 874, D 892, D 1091, D 2270, D 2622, D 2887, D 2896, D 3228, D 4047, D 4297, D 4624, D 4628, D 4683, D 4684, D 4741, D 4927, D 4951, D 5185 and Engine Sequence Test methods are available from ASTM, 1916 Race Street, Philadelphia, PA 19103.

SAE J183, J300, and J1423 are available from Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096. Reference oils for the Compatibility and Stability test can be obtained by writing to SAE at the above address attention Land and Sea Department.

The preparing activity for this item description is: US Army Belvoir Research, Development, and Engineering Center, ATTN: STRBE-TSE, Fort Belvoir, VA 22060-5606.

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

Preparing activity:
Army - ME

Project 9150-1103

Review activities:
Navy - AS, MC, SA
Air Force - 11
DLA - PS, GS

User activity:
Army - AT, CD, SM
Navy - OS