NOT MEASUREMENT SENSITIVE

MIL-PRF-32033
w/AMENDMENT 2
11 JULY 2006
SUPERSEDING
MIL-PRF-32033
w/AMENDMENT 1
27 JUNE 2001

PERFORMANCE SPECIFICATION

LUBRICATING OIL, GENERAL PURPOSE, PRESERVATIVE (WATER-DISPLACING, LOW TEMPERATURE)

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 type and grade of water-displacing, preservative lubricating oil, known hereinafter as "oil", for general purpose applications at low temperatures. The oil can be applied by dipping, brushing, or by spraying from gas-pressurized cans. The oil is identified by Military Symbol PL-S and NATO Code Number O-190.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements in documents cited in sections 3 and 4 of this specification, whether or not they are listed.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army RDECOM, ATTN: AMSRD-TAR-D,MS110, Warren, MI 48397-5000.

AMSC N/A FSC 9150

2.2 Government documents.

2.2.1 Specifications, standards and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issue of these documents shall be those listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

DEPARTMENT OF DEFENSE

MIL-PRF-680 - Degreasing Solvent.

STANDARDS

FEDERAL

FED-STD-791 - Lubricants, Liquid Fuels, and Related Products; Methods of Testing.

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings, and publications. The following other Government document forms a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

ACGIH Threshold Limit Values and Biological Exposure Indices for Chemical Substances .

(Application for copies should be addressed to the American Conference of Governmental Industrial Hygienists, 1330 Kemper Meadow Drive, Cincinnati, OH 45240 or website: http://www.acgih.org)

DEPARTMENT OF LABOR (DOL)

29 CFR 1910.1200 - Hazard Communication

(Requests for copies of the Code of Federal Regulations (CFR) Guideline may be obtained from the Superintendent of Documents, US Government Printing Office, Washington, DC 20402 or from their website http://www.gpoaccess.gov/cfr/index.html)

NATIONAL TOXICOLOGY PROGRAM - Annual Report on Carcinogens.

(Requests for copies should be addressed to the Annual Report on Carcinogens, National Toxicology Program, PO Box 12233, Research Triangle Park, NC 27709 or from their website http://ntp.niehs.nih.gov)

2.3 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).

ASTM INTERNATIONAL

ASTM D 91	- Precipitation Number of Lubricating Oils (DoD Adopted).
ASTM D 92	- Flash and Fire Points by Cleveland Open Cup Tester (DoD Adopted).
ASTM D 97	- Pour Point of Petroleum Products (DoD Adopted).
ASTM D 130	- Corrosiveness to Copper from Petroleum Products by Copper Strip Test (DoD Adopted).
ASTM D 445	- Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity) (DoD Adopted).
ASTM D 972	- Evaporation Loss of Lubricating Greases and Oils (DoD Adopted).
ASTM D 974	- Acid and Base Number by Color-Indicator Titration (DoD Adopted).
ASTM D 1152	- Methanol (Methyl Alcohol).
ASTM D 1500	- ASTM Color of Petroleum Products (ASTM Color Scale) (DoD Adopted).
ASTM D 1748	- Rust Protection by Metal Preservatives in the Humidity Cabinet (DoD Adopted).
ASTM D 4172	- Wear Preventive Characteristics of Lubricating Fluid (Four-Ball Method) (DoD Adopted).
ASTM D 4636	- Corrosiveness and Oxidation of Hydraulic Oils, Aircraft Turbine Engine Lubricants and Other Highly Refined Oils (DoD Adopted).
ASTM D 6547	- Standard Test Method for Corrosiveness of Lubricating Fluid to Bimetallic Couple.

(Application for copies should be addressed to ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959 or can be found on their website http://www.astm.org)

2.4 Order of precedence. In the event of a conflict 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 Qualification. The lubricants furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list (QPL) before contract award (see 4.1.1, and 6.3). After the oil qualifies, there shall be no change in formulation or manufacturing procedure. Any change in the formulation of a qualified product will necessitate its requalification (see 6.9).

3.2 Materials. Unless otherwise specified herein, the chemical formula of the oil is the prerogative of the contractor as long as all articles submitted to the Government fully meet the operating, interface, support and ownership, and environmental requirements specified.

3.2.1 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.

3.3 Operating requirements.

3.3.1 Kinematic viscosity. The kinematic viscosity of the oil shall be as specified in Table I (see 4.2.2.1).

TABLE I. Kinematic viscosity.

Kinematic viscosity, (mm^2/s)	
@ 40 degrees Celsius (°C), minimum.	11
@ -40°C, maximum.	7,000
@ -54°C, maximum.	60,000

3.3.2 Corrosion protection (humidity cabinet). The oil shall protect metal to the extent that no more than a combined total of three corrosion dots, none of which exceed 1 millimeter (mm) in diameter, occur on the panels (see 4.2.2.2).

3.3.2.1 Removability. The oil shall leave no visual evidence of oil residue, stain or discoloration on metals (see 4.2.2.2.1).

3.3.3 Water displacement and water stability. The oil, after storage in contact with water, shall satisfactorily displace water as evidenced by the absence of rust, mottling, or surface stains on the panels (see 4.2.2.3).

3.3.4 Corrosiveness (bimetallic couple). The oil shall protect metal to the extent that no more than a combined total of three corrosion dots, none of which exceed 1 mm in diameter, occur on the discs (see 4.2.2.4).

3.3.5 Wear. The oil shall lubricate the steel balls such that the average scar diameter on the steel balls shall not exceed 1 mm (see 4.2.2.5).

3.4 Interface requirements.

3.4.1 Copper strip corrosion. The oil shall not tarnish the copper strip exceeding the value of 2a on the ASTM Copper Strip Corrosion Standards (see 4.2.3.1).

3.4.2 Corrosiveness and oxidation stability (metal protection). The oil shall not produce corrosion or oxidation effects on metal specimens greater than a weight gain or loss of 0.2 milligrams/square centimeter (mg/cm^2). The oil shall not pit nor etch the surface of the metal specimens. The oxidized oil shall exhibit no insoluble materials or gum when examined (see 4.2.3.2).

3.4.2.1 Viscosity stability. The viscosity change of the oxidized oil at 40°C shall be not more than a 5 percent (%) decrease or a 20% increase (see 4.2.3.2.1).

3.4.2.2 Neutralization number change. The neutralization number of the oxidized oil shall not be more than 0.20 higher than the initial neutralization number of unoxidized oil (see 4.2.3.2.2).

3.4.3 Color. The ASTM Color of the oil shall not be greater than 7.0 (see 4.2.3.3).

3.5 Support and ownership requirements.

3.5.1 Solid sediment/precipitation number. The oil shall generate not more than 0.05 milliliters (mL) mean total volume of sediment (see 4.2.4.1).

3.5.2 Toxicity. The oil shall have no adverse (injurious or damaging) effects on human health when it is used as intended (see 6.1). Blenders, formulators, and suppliers shall follow the guidelines of OSHA 29 CFR 1910.1200, the ACGIH Threshold Limit Values and Biological Exposure Indices and the most current National Toxicology Program's Annual Report on Carcinogens (see 4.2.4.2).

3.5.3 Product identification. Each unit container and its exterior package shall be labeled as follows (see 4.2.4.3):

LUBRICATING OIL, GENERAL PURPOSE, PRESERVATIVE

WARNING!

*DO NOT USE THIS OIL IN THE PROCESSING OR HANDLING EQUIPMENT OR SURFACE THAT MAY CONTACT FOOD!
*DO NOT ALLOW THE OIL TO CONTAMINATE FOODSTUFF!
*DO NOT USE THIS OIL IN ANY FUEL SYSTEM OR COMBUSTION CHAMBER OF ENGINES!

3.5.3.1 Warning for gas-pressurized cans. In addition to the marking specified in 3.5.3, oil supplied in gas-pressurized cans shall be marked as follows:

WARNING!
CONTENTS UNDER PRESSURE

*DO NOT STORE THIS CAN ABOVE 49°C (120°F)!
*KEEP AWAY FROM DIRECT SUNLIGHT, RADIATORS, STOVES, HOT WATER, OR OTHER HEAT SOURCES!
*DO NOT PUNCTURE THIS CAN NOR PLACE IT IN AN INCINERATOR!

3.5.4 Fill (gas-pressurized cans only). The oil supplied in gas-pressurized cans shall have a minimum net weight of 12.5 ounces (see 4.2.4.4).

3.6 Environmental requirements.

3.6.1 Flash point. The minimum flash point of the oil shall be 135°C (see 4.2.5.1).

3.6.2 Pour point. The maximum pour point of the oil shall be –57°C (see 4.2.5.2).

3.6.3 Evaporation loss. The maximum mass percent evaporation loss of the oil shall be 25% (see 4.2.5.3).

3.6.4 Low temperature stability. The oil shall show no evidence of gelling, crystallization, solidification or separation of insoluble material when subjected to a temperature of -45°C for 72 hours (see 4.2.5.4).

3.6.5 Film characteristics/high temperature stability. The oil shall show no evidence of becoming gummy, tacky, or hard when subjected to a temperature of 100°C for 24 hours (see 4.2.5.5).

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. Qualification inspection (see 4.1.1).
b. Conformance inspection (see 4.1.2).

4.1.1 Qualification inspection. Qualification inspection shall consist of tests for all of the requirements specified in section 3 and may be conducted in any plant or laboratory approved by the qualifying activity (see 6.3).

4.1.2 Conformance inspection. Conformance inspection consists of tests for all of the requirements specified in section 3 and may be conducted in any plant or laboratory approved by the qualifying activity.

4.2 Verification methods. Acceptable verification methods included in this section are visual inspection, and measurement, sample tests, full-scale demonstration tests, simulation, modeling, engineering evaluation, component properties analysis, and similarity to previously approved or previously qualified designs.

4.2.1 Verification alternatives. The manufacturer may propose alternative test methods, techniques, or equipment, including the application of statistical process control, tool control, or cost effective sampling procedures to verify performance. See the contract for alternatives that replace verification methods required by this specification.

4.2.2 Operating requirements verifications.

4.2.2.1 Kinematic viscosity. To determine conformance to 3.3.1, the oil shall be tested in accordance with (IAW) ASTM D 445, and exhibit a kinematic viscosity within the range specified in table I.

4.2.2.2 Corrosion protection (humidity cabinet). To determine conformance to 3.3.2, the oil shall be tested IAW ASTM D 1748 for 192 hours and shall pass (see 6.8).

4.2.2.2.1 Removability. To determine conformance to 3.3.2.1, the oil shall be tested by completely immersing the three oil-coated test panels used for the humidity cabinet test (see 4.2.2.2) in a breaker containing degreasing solvent IAW MIL-PRF-680 at 25°C and agitating the solvent slightly for not more than one minute. Then, repeat this process with methanol IAW ASTM D 1152. After removal from the solvent, the test panels shall not evidence any oil residue, stain, or discoloration.

4.2.2.3 Water displacement and water stability. To determine conformance to 3.3.3, the oil shall be tested IAW method 3007 of FED-STD-791. There shall be no evidence of rust, mottling, or surface stains on the panels following the test.

4.2.2.4 Corrosiveness (bimetallic couple). To determine conformance to 3.3.4, the oil shall be tested IAW ASTM-D 6547 Standard Test Method for Corrosiveness of Lubricating Fluid to Bimetallic Couple. There shall be no evidence of rust, mottling, or surface stains on the panels following the test.

4.2.2.5 Wear. To determine conformance to 3.3.5, the oil shall be tested IAW ASTM D 4172 using 40± 0.2 kgf (392±2N). Following the test, the average scar diameter on the steel balls shall not exceed 1 mm.

4.2.3 Interface requirements verifications.

4.2.3.1 Copper strip corrosion. To determine conformance to 3.4.1, the oil shall be tested IAW ASTM D 130 for 3 hours at 100°C. The copper strips shall exhibit a value not more than 2a IAW the ASTM Copper Strip Corrosion Standards.

4.2.3.2 Corrosiveness and oxidation stability (metal protection). To determine conformance to 3.4.2, the oil shall be tested IAW ASTM D 4636 for 168 hours. The oil shall not produce corrosion or oxidation effects on metal specimens greater than a weight gain or loss

of 0.2 mg/cm^2, nor pitting or etching of the surfaces. The oxidized oil shall not evidence any insoluble materials or gum.

4.2.3.2.1 Viscosity stability. To determine conformance to 3.4.2.1, after completing the corrosiveness and oxidation stability test (see 4.2.3.2), determine the viscosity of the oil sample at 40°C IAW ASTM D 445. The calculated viscosity change, based on the original viscosity of the oil, shall be not more than a 5% decrease or a 20% increase.

4.2.3.2.2 Neutralization number change. To determine conformance to 3.4.2.2, after completing the corrosiveness and oxidation stability test (see 4.2.3.2), determine the neutralization number of the oil IAW ASTM D 974. The neutralization number shall not be more than 0.20 higher than the original neutralization number of the oil.

4.2.3.3 Color. To determine conformance to 3.4.3, the oil shall be tested IAW ASTM D 1500, and shall exhibit a color not greater than 7.0.

4.2.4 Support and ownership requirements verifications.

4.2.4.1 Solid sediment/precipitation number. To determine conformance to 3.5.1, the oil shall be tested IAW ASTM D91, and shall not generate more than 0.05 mL mean total volume of sediment.

4.2.4.2 Toxicity. To determine conformance to 3.5.2, components of the oil's formulation shall be compared with the toxic limits established by the guidelines of OSHA 29 CFR 1910.1200, the ACGIH Threshold Limit Values and Biological Exposure Indeces, and the most current National Toxicology Program's Annual report on Carcinogens. Oils with components exceeding the toxic limits shall be disqualified. Methods of quantitative determination shall be selected at the discretion of both the qualifying activity and the manufacture/blender.

4.2.4.3 Product identification. To determine conformance to 3.5.3 and 3.5.3.1, the oil unit containers shall be examined for the proper product warning/identification.

4.2.4.4 Fill (gas-pressurized cans only). To determine conformance to 3.5.4, a can of the oil shall be weighed. The oil shall be sprayed from the can in three-minute periods, followed by one minute pauses, until the can is empty. The can shall then be re-weighed, and the net weight calculated. The calculated net weight shall not be less than 12.5 ounces.

4.2.5 Environmental requirements verifications.

4.2.5.1 Flash point. To determine conformance to 3.6.1, the oil shall be tested IAW ASTM D 92, and shall exhibit a minimum flash point of 135°C.

4.2.5.2 Pour point. To determine conformance to 3.6.2, the oil shall be tested IAW ASTM D 97, and shall exhibit a maximum pour point of –57°C.

4.2.5.3 Evaporation loss. To determine conformance to 3.6.3, the oil shall be tested at 100°C IAW ASTM D 972, and shall exhibit a maximum mass percent evaporation loss of 25%.

4.2.5.4 Low temperature stability. To determine conformance to 3.6.4, the oil shall be tested at -45°C IAW method 3458 of FED-STD-791, and shall not exhibit any gelling, crystallization, solidification or separation of insoluble material.

4.2.5.5 Film characteristics/high temperature stability. To determine conformance to 3.6.5, coat a glass panel or a microscope slide with a sample of the oil. Next, drain the panel for 24 hours at an angle of 45° with the horizontal and at a temperature of 25° ± 3°C. Then store the panel in an oven at 100°C for 24 hours. The oil shall not exhibit any gumminess, tackiness or hardness.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature which may be helpful, but is not mandatory.)

6.1 Intended use. The lubricating oil, general purpose, preservative, is intended for lubrication and protecting against corrosion of certain small arms and automatic weapons and whenever a general purpose, water-displacing, low-temperature lubricating oil is required. This oil becomes very viscous at low temperatures so that its use at temperatures below -40°C is limited by a number of machine design factors and should be proved for any specific item application by test before adoption. The availability of this material in gas-pressurized containers will prove to be beneficial for use in areas difficult to preserve by existing procedures. This preservative oil should not be used to protect the fuel system and combustion chamber of engines which are preserved in accordance with standard procedures. This material contains a carboxylic acid which could react with certain metals present in the fuel system, forming soaps which could contribute to fuel filter plugging.

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of this specification.
b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2.1 and 2.3).
c. Location of verification testing (see 4.1).
d. Packaging requirements (see 5.1).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Products List QPL No. 32033, whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from: Department of the Army, U.S. RDECOM, F & L Technology Team, ATTN: AMSRD-TAR-D, MS110, Warren, Michigan 48397-5000.

6.4 Definitions.

6.4.1 Film characteristics. A drying process progresses through three stages identified as gummy, tacky, and hard. These are defined as follows:

a. Gummy - First evidence of becoming viscous.
b. Tacky - Advanced stage of drying, becoming sticky.
c. Hard - A completely dry-to-touch film.

6.5 International standardization agreement implementation. This specification implements NATO STANAG 1135 - Interchangeability Of Fuels, Lubricants And Associated Products Used By The Armed Forces Of The North Atlantic Treaty Nations. When amendment, revision, or cancellation of this specification is proposed, the preparing activity must coordinate the action with the U.S. National Point of Contact for the international standardization agreement, as identified in the ASSIST database at http://assist.daps.dla.mil.

6.6 Waste disposal instructions.

6.6.1 Recovery (RC). Coordinate with your local Defense Reutilization and Marketing Office (DRMO) for the turn-in and disposal of any excess items of supply. You can locate the nearest DRMO by viewing their website at http://www.drms.dla.mil and clicking on "DRMO Sites" located on the left side of the page. You can also click on "Customer Service" located at the bottom of the page and ask for assistance in determining the closest DRMO. The Defense Materiel Disposition Manual, DOD 4160.21-M, describes the requirements for such turn-ins. The DRMO will identify whether they can accept physical custody of the property or only receive it in-place, in which the generator will retain physical custody of the property while the DRMO processes it through the disposal cycle. The potential for DRMO acceptance and disposal processing is enhanced by comprehensive identification. If the DRMO can not accept the item for disposal (accountability), the manufacturer/supplier should be contacted for chemical recovery before proceeding with ultimate disposal management procedures.

DISCLAIMER

THE RECOMMENDED DISPOSAL INSTRUCTION IS FORMULATED FOR USE BY ELEMENTS OF THE DEPARTMENT OF DEFENSE. THE UNITED STATES OF AMERICA IN NO MANNER WHATSOEVER EXPRESSLY OR IMPLIEDLY WARRANTS, STATES, OR INTENDS SAID INSTRUCTION TO HAVE ANY

APPLICATION, USE, OR VIABILITY BY OR TO ANY PERSON OR PERSONS OUTSIDE THE DEPARTMENT OF DEFENSE NOR ANY PERSON OR PERSONS CONTRACTING WITH ANY INSTRUMENT OF THE UNITED STATES OF AMERICA AND DISCLAIMS ALL LIABILITY FOR SUCH USE. ANY PERSON UTILIZING THIS INSTRUCTION WHO IS NOT A MILITARY OR CIVILIAN EMPLOYEE OF THE UNITED STATES OF AMERICA SHOULD SEEK COMPETENT PROFESSIONAL ADVICE TO VERIFY AND ASSUME RESPONSIBILITY FOR THE SUITABILITY OF THIS INSTRUCTION TO THEIR PARTICULAR SITUATION REGARDLESS OF SIMILARITY TO A CORRESPONDING DEPARTMENT OF DEFENSE OR OTHER GOVERNMENT SITUATION.

6.7 Material Safety Data Sheets (MSDS). Contracting officers will identify those activities requiring copies of MSDS's prepared in accordance with FED-STD-313. The pertinent Government mailing addresses for submission of data are listed in FED-STD-313; and 29 CFR 1910.1200 requires that the MSDS for each hazardous chemical used in an operation must be readily available to personnel using the material. Contracting officers will identify the activities requiring copies of the MSDS.

6.8 Panel preparation for oil in gas-pressurized cans. Historically, the following procedure has been found to provide the best results for humidity cabinet testing of oil supplied in gas-pressurized cans (see 3.3.2 and 4.2.2.2): Shake a gas-pressurized can of oil vigorously for 30 seconds. Set the cleaned panels at an angle of 15° from vertical. Hold the pressurized can vertically at a distance of 25 to 30 centimeters from the panel. With the valve open, move the can to direct the spray from one edge of the panel to the other. Make sufficient passes to assure a continuous coating. After five minutes examine the coating to determine if it is smooth and unbroken. If the coating shows evidence of gas entrapment, prepare another panel. Drain the panels for 2 hours and submit them to the test specified in ASTM D1748.

6.9 QPL tolerances. The oils supplied under contract should have the same formulation as when qualified. The finished oil properties should fall within permissible tolerances as listed in table II. However, after the application of tolerances, the values of the properties of the oil should not exceed the maximum nor fall below the minimum requirements specified herein.

TABLE II. QPL tolerances.

Property	Tolerance
Kinematic viscosity @ 40°C (see 3.3.1)	±1.1 cSt
Kinematic viscosity @ -40°C (see 3.3.1)	±700 cSt
Kinematic viscosity @ -54°C (see 3.3.1)	±600 cSt
Pour point (see 3.6.2)	±6°C
Flash point (see 3.6.1)	±10°C
Wear (scar diameter) (see 3.3.5)	±0.30 mm
Evaporation loss (see 3.6.3)	±5.0%

6.10 Subject term (key word) listing.

Lubrication
NATO STANAGs 1135 and 7094

6.11 Amendment notations. The margins of this specification are marked with vertical lines to indicate modifications generated by this amendment. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations.

Custodians:
Army - AT
Navy - AS
Air Force - 11

Preparing Activity:
Army - AT

(Project 9150-2006-002)

Review Activities:
Army – AR, MI, MD, SM
Navy – MC, SA
Air Force –03, 50, 68
DLA – GS, PS

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at http://assist.daps.dla.mil