

**METRIC**

MIL-PRF-17672E

14 October 2010

SUPERSEDING

MIL-PRF-17672D

23 January 1984

**PERFORMANCE SPECIFICATION****HYDRAULIC FLUID, PETROLEUM, INHIBITED**

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

**1. SCOPE**

1.1 Scope. This specification covers petroleum base hydraulic fluids for use in hydraulic systems and in other applications where a high grade hydraulic fluid having anti-corrosion and anti-oxidation properties are required. This hydraulic fluid is not an extreme pressure (EP) or anti-wear (AW) fluid. This hydraulic fluid should not be used in systems where a fire-resistant fluid is required.

1.2 Classification. The hydraulic fluids covered by this specification are of the following ISO viscosity grades, as specified (see 6.2):

<b>ISO Viscosity Grade</b>	<b>Military Symbol</b>	<b>Grade Code</b>
32	2075-T-H	A
46	2110-T-H (NATO symbol H-573)	B
68	2135-T-H	C

1.3 Part or identifying number (PIN). PINs to be used for petroleum base hydraulic fluids acquired to this specification are created as follows:

<b>M</b>	<b>17672</b>	<b>-</b>	<b>X</b>
Prefix for Military Specification	Specification Number	-	Grade (see code in section 1.2)
Examples: M17672-A and M17672-C			

**2. APPLICABLE DOCUMENTS**

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 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 of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

Comments, suggestions, or questions on this document should be addressed to: Commander, Naval Sea Systems Command, ATTN: SEA 05S, 1333 Isaac Hull Avenue, SE, Stop 5160, Washington Navy Yard DC 20376-5160 or emailed to [CommandStandards@navy.mil](mailto:CommandStandards@navy.mil), with the subject line "Document Comment". Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <https://assist.daps.dla.mil/online>.

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## 2.2 Government documents.

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

### NAVAL SEA SYSTEMS COMMAND (NAVSEA) PUBLICATIONS

S9510-AB-ATM-010 - Nuclear Powered Submarine Atmosphere Control Manual

(Copies of the chapter titled "Material Control Program" are available from Commander, Naval Sea Systems Command, ATTN: SEA 05Z4, 1333 Isaac Hull Ave., SE, Stop 5122, Washington Navy Yard DC 20376-5122 or online at <https://smcl.dt.navy.mil>.)

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 these documents are those cited in the solicitation or contract.

### AMERICAN SOCIETY FOR QUALITY (ASQ)

ASQ Z1.4 - Sampling Procedures and Tables for Inspection by Attributes

(Copies of this document are available from the American Society for Quality, P.O. Box 3005, Milwaukee, WI 53201-3005, by calling (800) 248-1946 or online at <http://www.asq.org/>.)

### ASTM INTERNATIONAL

ASTM D92 - Standard Test Method for Flash and Fire Points by Cleveland Open Cup

ASTM D97 - Standard Test Method for Pour Point of Petroleum Products

ASTM D129 - Standard Test Method for Sulfur in Petroleum Products (General Bomb Method)

ASTM D130 - Standard Test Method for Corrosiveness to Copper from Petroleum Products by the Copper Strip Test

ASTM D189 - Standard Test Method for Conradson Carbon Residue of Petroleum Products

ASTM D287 - Standard Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method)

ASTM D445 - Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)

ASTM D524 - Standard Test Method for Ramsbottom Carbon Residue of Petroleum Products

ASTM D664 - Standard Test Method for Acid Number of Petroleum Products by Potentiometric Titration

ASTM D665 - Standard Test Method for Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water

ASTM D874 - Standard Test Method for Sulfated Ash from Lubricating Oils and Additives

ASTM D892 - Standard Test Method for Foaming Characteristics of Lubricating Oils

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ASTM D943	- Standard Test Method for Oxidation Characteristics of Inhibited Mineral Oils
ASTM D974	- Standard Test Method for Acid and Base Number by Color-Indicator Titration
ASTM D1298	- Standard Test Method for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
ASTM D1401	- Standard Test Method for Water Separability of Petroleum Oils and Synthetic Fluids
ASTM D1500	- Standard Test Method for ASTM Color of Petroleum Products (ASTM Color Scale)
ASTM D1552	- Standard Test Method for Sulfur in Petroleum Products (High-Temperature Method)
ASTM D2270	- Standard Practice for Calculating Viscosity Index from Kinematic Viscosity at 40 and 100°C
ASTM D2272	- Standard Test Method for Oxidation Stability of Steam Turbine Oils by Rotating Pressure Vessel
ASTM D2622	- Standard Test Method for Sulfur in Petroleum Products by Wavelength Dispersive X-ray Fluorescence Spectrometry
ASTM D4052	- Standard Test Method for Density and Relative Density of Liquids by Digital Density Meter
ASTM D4057	- Standard Practice for Manual Sampling of Petroleum and Petroleum Products
ASTM D4177	- Standard Practice for Automatic Sampling of Petroleum and Petroleum Products
ASTM D4310	- Standard Test Method for Determination of Sludging and Corrosion Tendencies of Inhibited Mineral Oils
ASTM D4530	- Standard Test Method for Determination of Carbon Residue (Micro Method)
ASTM D4898	- Standard Test Method for Insoluble Contamination of Hydraulic Fluids by Gravimetric Analysis
ASTM D4927	- Standard Test Method for Elemental Analysis of Lubricant and Additive Components – Barium, Calcium, Phosphorus, Sulfur, and Zinc by Wavelength Dispersive X-Ray Fluorescence Spectroscopy
ASTM D5950	- Standard Test Method for Pour Point of Petroleum Products (Automatic Tilt Method)
ASTM D6304	- Standard Test Method for Determination of Water in Petroleum Products, Lubricating Oils, and Additives by Coulometric Karl Fischer Titration
ASTM D6443	- Test Method for Determination of Calcium, Chlorine, Copper, Magnesium, Phosphorus, Sulfur, and Zinc in Unused Lubricating Oils and Additives by Wavelength Dispersive X-ray Fluorescence Spectrometry (Mathematical Correction Procedure)

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ASTM D6481

- Standard Test Method for Determination of Phosphorus, Sulfur, Calcium, and Zinc in Lubrication Oils by Energy Dispersive X-ray Fluorescence Spectroscopy

(Copies of these documents are available from ASTM International, 100 Barr Harbor Dr., PO Box C700, West Conshohocken, PA 19428-2959 or online at [www.astm.org](http://www.astm.org).)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, 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 hydraulic fluid furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list before contract award. (see 4.2 and 6.4).

3.1.1 Requalification. Unless otherwise approved by NAVSEA, any change in product composition, formulation, or ingredients shall require the product to be requalified (see 4.2.1). Minor changes, such as an increase in pour point additive or a change in base fluid materials, may require only notification; however, the extent of supporting test data required is at the discretion of NAVSEA. In addition, the qualification of previously qualified products shall be verified every 5 years by submission of a signed statement by the fluid supplier attesting that no changes in product composition, formulation, or ingredients have been made in the qualified product.

3.2 Material. The hydraulic fluid shall be a blend of virgin petroleum-base hydraulic fluid stocks plus additive agents, if necessary, to meet the requirements of this specification. The use of additives to improve the viscosity-temperature characteristics of the base stocks is not permitted. Additives, if used to meet the pour point requirement, shall not exceed 0.5 percent by weight. Additives, if used, shall not contain chlorine or zinc materials. Changes to the additive components in the sample granted qualification approval, is not authorized without the approval of the qualifying activity.

3.3 Off-gassing. The hydraulic fluid shall be certified for and assigned a usage category of either "Limited" or "Permitted" in accordance with the chapter titled "Material Control Program" of NAVSEA S9510-AB-ATM-010 (see 4.4.1 and 6.5).

3.4 2,6-Di-tert-butylphenol (DTBP) prohibition. DTBP (Chemical Abstract Service Registry Number 128-39-2) shall not be intentionally added to any hydraulic fluid produced under this specification. (see 4.4.2)

3.5 Toxicity. When evaluated in accordance with 4.4.3, the hydraulic fluid shall have no adverse effect on the health of personnel when used for its intended purpose and shall not cause any environmental problems during removal of the product (see 4.4.3 and 6.6).

#### 3.6 Performance requirements.

3.6.1 Hydraulic fluid compatibility. The hydraulic fluid shall be compatible with the reference hydraulic fluid(s) furnished by the Government when tested as specified in 4.4.4.

3.6.1.1 Compatibility testing. Unless otherwise specified, compatibility testing shall be conducted on all grades. If the manufacturer can verify in writing to NAVSEA that each grade of hydraulic fluid being qualified contains the same additive package, NAVSEA may grant reduced testing.

3.6.2 Homogeneity. Additive agents shall remain uniformly distributed throughout the hydraulic fluid at all temperatures above the pour point and up to 130 °C (266 °F). When visually inspected in accordance with 4.4.5, the hydraulic fluid shall not exhibit sedimentation or separation of insoluble materials.

3.6.3 Appearance. The hydraulic fluid shall be free of haze or cloudiness (see 4.4.6).

3.6.4 Chemical and physical requirements. The hydraulic fluid shall conform to the chemical and physical requirements as specified in [Table I](#).

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TABLE I. Chemical and physical requirements and test methods.

Characteristics	Limit			Method No.	ASTM No.
	2075 T-H	2110 T-H	2135 T-H		
API Gravity	Report <sup>1/</sup>	Report <sup>1/</sup>	Report <sup>1/</sup>		D287, D1298, D4052
Pour Point, °C (°F) maximum	-29 (-20)	-23 (-10)	-18 (0)		D97, D5950
Flash Point, °C (°F) minimum	157 (315)	163 (325)	171 (340)		D92
Viscosity, centistokes (cSt) @ 100 °C (212 °F)	Report <sup>1/</sup>	Report <sup>1/</sup>	Report <sup>1/</sup>		D445
Viscosity, centistokes (cSt) @ 40 °C (104 °F)	28.8 - 35.2	41.4 - 50.6	61.2 - 74.8		D445
Viscosity Index, minimum	94	94	94		D2270
Acid Number, mg KOH/g, maximum	0.20	0.20	0.20		D974, D664
Corrosion, copper strip @ 100 °C (212 °F), maximum	1	1	1		D130
Rust Prevention (in the presence of salt water)	Pass	Pass	Pass		D665 procedure B <sup>2/</sup>
Water, percent maximum	0.01	0.01	0.01		D6304
Sulfated Ash, mass percent	Report <sup>1/</sup>	Report <sup>1/</sup>	Report <sup>1/</sup>		D874
Foam Characteristics, after blowing/after 10 minutes:					D892 <sup>3/</sup>
Sequence I, milliliter maximum	65/0	65/0	65/0		
Sequence II, milliliter maximum	65/0	65/0	65/0		
Sequence III, milliliter maximum	65/0	65/0	65/0		
Emulsion Test, after 30 minutes settling time:					D1401 <sup>4/</sup>
Oil Layer/Water Layer/Emulsion Layer, maximum	41/-/3	41/-/3	41/-/3		
Oxidation Test, after 1000 hours:					D943
Acid Number, mg KOH/g, maximum	2.0	2.0	2.0		D974, D664
Total Sludge, mg maximum	100	100	100		D4310
Total Iron, mg maximum	100	100	100		D4310 <sup>5/</sup>
Total Copper, mg maximum	100	100	100		D4310
Oxidation Stability by Rotating Bomb	Report <sup>1/</sup>	Report <sup>1/</sup>	Report <sup>1/</sup>		D2272
Solid Particle Contamination, mg/100 milliliter maximum <sup>6/</sup>	2.5	2.5	2.5		D4898
ASTM Color	Report <sup>1/</sup>	Report <sup>1/</sup>	Report <sup>1/</sup>		D1500
Sulfur	Report <sup>1/</sup>	Report <sup>1/</sup>	Report <sup>1/</sup>		D129, D1552, D2622, D4927, D6443, D6481

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TABLE I. Chemical and physical requirements and test methods. - Continued

Characteristics	Limit			Method No.	ASTM No.
	2075 T-H	2110 T-H	2135 T-H		
Conradson Carbon Residue	Report <sup>1/</sup>	Report <sup>1/</sup>	Report <sup>1/</sup>		D189, D524 <sup>2/</sup> , D4530
Homogeneity, sedimentation or separation	None	None	None	See 4.4.5	
NOTES: <sup>1/</sup> No limiting requirements. Test values shall be recorded in the test report. <sup>2/</sup> Prior to the test, the fluid shall be water washed as follows: 300 grams of the fluid to be tested shall be stirred with 50 grams of water for 30 minutes at 90 °C (194 °F) using the beaker and stirrer as specified in ASTM D665. After 30 minutes stirring, the mixture shall be transferred to a separatory funnel and left to separate; then the water layer shall be drawn off and the fluid submitted to the salt water corrosion test. <sup>3/</sup> Option A shall not be used. A ring of bubbles around the edge of the graduate shall be considered complete collapse or zero milliliters. <sup>4/</sup> Distilled water and stirring temperature of 54 °C (130 °F) shall be used. Discrete water droplets entrained in the oil layer and clinging to the wall of the cylinder may be added to the water layer volume at the rate of 0.1 milliliter per droplet. The results shall be reported using the format of oil layer/water layer/emulsions layer (time in minutes). There is no requirement for water layer. The emulsion limit applies to any of the three types of emulsions defined in the test method. If more than one emulsion type is present, the three milliliter maximum limit applies to the combined volume of the different emulsion types. <sup>5/</sup> Determine total iron content using the procedure and calculations described in sections 12 and 13 of ASTM D4310, except substitute iron in place of copper where appropriate. <sup>6/</sup> Test sample in accordance with ASTM D4898 using 0.8 micrometer pore diameter membrane filters. <sup>7/</sup> If ASTM D524 is used to determine carbon residue, the reported result must be converted from Ramsbottom to Conradson using the correlation data within ASTM D189 or D524.					

#### 4. VERIFICATION

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

- a. Qualification inspection (see 4.2).
- b. Conformance inspection (see 4.3).

4.2 Qualification inspection. Qualification inspection shall be performed at a Government-approved laboratory and conducted as specified in 4.4 and [Table I](#). A minimum sample size of 10 gallons is required for qualification testing.

4.2.1 Requalification. Unless otherwise approved by NAVSEA, requalification shall consist of the tests specified in 4.4 and [Table I](#). (see 3.1.1)

4.3 Conformance inspection. The conformance inspection shall consist of the tests specified in 4.4.6 and [Table I](#), except the 1000-hour oxidation test and compatibility test shall not be required. In addition, each lot of filled containers shall be examined as specified in 4.4.

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4.3.1 Lot acceptance requirements. The results from each sample, when tested as specified in [Table I](#), shall not vary from the results of the qualified sample by more than the tolerances listed in [Table II](#), and shall meet the requirements specified in [Table I](#) when so indicated in [Table II](#):

Table II. Tolerances of physical properties.

Property	Tolerance
Gravity, degrees API	±1.0
Sulfur, %	
Original sulfur level ≥ 0.15	±20
Original sulfur level < 0.15	+0.08
Viscosity @ 40°C (104°F), centistokes <sup>1/</sup>	±8
Pour point, °C <sup>1/</sup>	+3
Oxidation stability by rotating bomb, %	-15
<sup>1/</sup> Samples shall meet the requirements specified in <a href="#">Table I</a> .	

If base oil materials have changed from the sample at qualification, the above sulfur tolerance does not apply.

#### 4.3.2 Inspection lot.

4.3.2.1 At place of manufacture. For the purpose of sampling, one lot of hydraulic fluid shall consist of a manufacturer's batch. When material cannot be identified by batch, one lot shall consist of not more than 10,000 gallons (38 cubic metres).

4.3.2.2 At place of delivery. For the purpose of sampling, a delivery lot of hydraulic fluid shall consist of hydraulic fluid in a single shipment.

#### 4.3.3 Sampling for conformance.

4.3.3.1 Sampling a storage tank. A representative sample of five gallons of hydraulic fluid shall be taken from each lot as specified in ASTM D4057.

4.3.3.2 Sampling during loading. Samples shall be drawn at the discharge pipe when it enters the bulk carriers (tank cars, tank trucks, and so forth). At least four samples shall be taken at regular intervals during the entire period of loading or filling, each sample being one pint. Only one sample for one continuous drum filling operation is required and shall be taken after approximately 10 percent of the volume of product has been drummed.

4.3.3.3 Sampling of filled containers. Samples from a packaged lot (see 6.9) shall be taken for testing in accordance with ASTM D4057 or ASTM D4177, as appropriate. The contents of each container to be sampled shall be shaken, rolled, or stirred to mix the contents thoroughly. Quart samples shall be drawn from four randomly selected drums in the lot and composited. Equal portions shall be withdrawn from approximately the center of each container by means of a thief or other sampling device.

4.3.3.4 Examination of filled containers. A random sample of filled containers shall be selected from each lot in accordance with ASQ Z1.4 at Inspection Level II to verify compliance with this specification regarding fill, closure, marking, and other requirements not involving tests. Samples shall be examined for defects of the container and the closure, for evidence of leakage and for unsatisfactory markings. Each container shall also be weighed to determine the amount of the contents. Any container in the sample having one or more defects or under required fill shall be cause for rejection of the container.

#### 4.4 Test methods.

4.4.1 Off-gassing. The hydraulic fluid shall be tested by a Government-approved testing facility in accordance with NAVSEA S9510-AB-ATM-010 chapter titled "Material Control Program". The results shall be submitted to the Government for evaluation and approval for use (see 3.3 and 6.5).



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4.4.2 2,6-Di-tert-butylphenol (DTBP). Analytical data from a NAVSEA-approved laboratory shall be submitted to document relative absence of DTBP, and if detected, shall not exceed 10 parts per million (see 3.4). For information on obtaining NAVSEA-approved laboratories, see 6.4.

4.4.3 Toxicity. The hydraulic fluid shall be evaluated by the Navy and Marine Corps Public Health Center (NMCPHC) using the administrative Health Hazard Assessment (HHA). Sufficient data to permit an HHA of the product shall be provided by the manufacturer/distributor to the NMCPHC. To obtain current technical information requirements specified by the NMCPHC, see 6.6.

4.4.4 Hydraulic fluid compatibility. A 1:1 mixture of the hydraulic fluid and each reference hydraulic fluid shall be subjected to the oxidation (ASTM D943), rust prevention (in the presence of salt water), foam, and emulsion tests specified in [Table I](#) (see 3.6.1). Mixtures meeting the requirements specified in [Table I](#) are considered compatible fluids. The reference hydraulic fluid(s) shall be fluid(s) from the Qualified Products Database (QPD) associated with this specification. For contact information for obtaining reference hydraulic fluid(s), see 6.4.

4.4.5 Homogeneity. After determining the pour point of the hydraulic fluid, return the test jar and hydraulic fluid to the cooling bath, cool to 12 °C (53 °F) below the pour point, and hold at that temperature for three hours. Remove the test jar from the cooling bath and allow to warm to room temperature. Visually examine the test hydraulic fluid for sedimentation or separation of insoluble materials. Then, place the test jar and hydraulic fluid in a heating bath, bring the temperature of the bath to 130±2.8 °C (266±5.0 °F), and hold at that temperature for one hour. Remove the test jar of hydraulic fluid from the bath and allow to cool in air to room temperature. The test hydraulic fluid shall be examined visually for sedimentation or separation of insoluble materials (see 3.6.2).

4.4.6 Appearance. Assess the appearance of the hydraulic fluid by filling a clear quart-sized bottle with the hydraulic fluid and hold the sample in front of a strong light source. Inspect the hydraulic fluid for any cloudiness or haziness. (see 3.6.3)

## 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. 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 that may be helpful, but is not mandatory.)

6.1 Intended use. The hydraulic fluid is intended for use in shipboard hydraulic systems not requiring the use of a fire-resistant hydraulic fluid.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Military Symbol required (see 1.2).
- c. Quantity in gallons (litre).
- d. Packaging requirements (see 5.1).
- e. Material safety data sheet (see 6.7).

6.3 General. For purposes of determining conformance with these requirements, an observed value or calculated value should be rounded off "to the nearest unit" in the last right-hand digit used in expressing the specification limit, in accordance with the rounding-off method of ASTM E29, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications.



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6.4 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-17672 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 orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Commander, Naval Sea Systems Command, ATTN: SEA 05S, 1333 Isaac Hull Ave., SE, Stop 5160, Washington Navy Yard DC 20376-5160 or emailed to [CommandStandards@navy.mil](mailto:CommandStandards@navy.mil). An online listing of products qualified to this specification may be found in the Qualified Products Database (QPD) at <https://assist.daps.dla.mil/online>.

6.5 Off-gassing. Materials to be installed in submarines are to be controlled to prevent off-gassing, which contaminates the atmosphere and can result in health hazards to personnel or deleterious effects on machinery. These controls are accomplished through the Submarine Material Control Program, which is described in the Nuclear Powered Submarine Atmosphere Control Manual, NAVSEA S9510-AB-ATM-010 chapter titled "Material Control Program". Under the Submarine Material Control Program, all materials considered for use on submarines require certification and assignment of a usage category. Under the certification process, candidate materials are selected by Navy activities or contractors, and a request for certification is submitted to the Naval Sea Systems Command, SEA 05S, 1333 Isaac Hull Ave., SE, Stop 5160, Washington Navy Yard DC 20376-5160. The certification request is accompanied by detailed information, including descriptions of the material, method of application, usage, and storage. A chemical analysis is conducted, which is normally accomplished through off-gas testing. The off-gas test is required to be conducted in a Government-approved laboratory designated by the preparing activity. Information pertaining to this test requirement may be obtained from the Naval Sea Systems Command, SEA 05S, 1333 Isaac Hull Ave., SE, Stop 5160, Washington Navy Yard, DC 20376-5160 or emailed to [commandstandards@navy.mil](mailto:commandstandards@navy.mil). Based on the chemical analysis results, a usage category is assigned to the material defining whether, and to what extent, the material may be used on submarines.

6.6 Toxicity evaluation. The Navy and Marine Corps Public Health Center (NMCPHC) requires sufficient information to permit an HHA of the fluid. The HHA is a review of the fluid based on information submitted by the manufacturer to assess health hazards associated with the handling, application, use, and removal of the product. Any questions concerning toxicity and requests for HHA should be addressed to the Commanding Officer, Navy and Marine Corps Public Health Center (NMCPHC), ATTN: Industrial Hygiene Department, Acquisition Technical Support Division, 620 John Paul Jones Circle, Suite 1100, Portsmouth, VA 23708-2103. Upon receipt of the HHA, a copy should be provided to the Naval Sea Systems Command, ATTN: SEA 05S, 1333 Isaac Hull Ave., SE, Stop 5160, Washington Navy Yard, DC 20376-5160 or emailed to [commandstandards@navy.mil](mailto:commandstandards@navy.mil).

6.7 Material safety data sheets (MSDS). Contracting officers will identify those activates requiring copies of completed MSDS prepared in accordance with FED-STD-313. In order to obtain the MSDS, FAR clause 52.223-3 must be in the contract.

6.8 International standardization agreement implementation. This specification implements North Atlantic Treaty Organization Standardization Agreement (NATO STANAG) 4601, Guide Specifications for Hydraulic Fluids for Naval Applications (H-573, H-574, and H-576). 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 <https://assist.daps.dla.mil/online>.

6.9 Packaged lot. A packaged lot consists of an indefinite number of 55-gallon drums or smaller unit packages of identical size and shape, offered for acceptance, and filled with a homogeneous mixture of fluid from a single, isolated container, or filled with a homogeneous mixture of fluid.

#### 6.10 Subject term (key word) listing.

Anti-corrosion

Anti-oxidation

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

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Custodians:

Army – GL  
Navy – SH  
Air Force – 68

Preparing Activity:

Navy – SH  
(Project 9150-2011-002)

Review Activities:

Army – AT, CR4  
Navy – AS  
DLA – GS

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 <https://assist.daps.dla.mil/online>.