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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 documents cited in sections 3 and 4 of this specification, whether or not they are listed.

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 issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE STANDARDS

MS24529 - Cap, Lubrication Fitting, Protective

(Copies of these documents are available online at <http://quicksearch.dla.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.

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 17025 - General requirements for the competence of testing and calibration laboratories

(Copies of these documents are available online at <http://www.iso.org> or from the International Organization for Standardization American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036.)

NCSL INTERNATIONAL

NCSL Z540.3 - Requirements for the Calibration of Measuring and Test Equipment

(Copies of these documents are available online at <http://www.ncsli.org> or from NCSL International 2995 Wilderness Place, Suite 107 Boulder, Colorado 80301-5404.)

SAE INTERNATIONAL

SAE-AS15000 - Fitting End, Lubrication, Hydraulic - Design Standard

(Copies of these documents are available on line at <http://standards.sae.org/> from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

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 (except for related specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

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3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheet. In the event of any conflict between the requirements of this specification and the specification sheet, the latter shall govern.

3.2 First article. When specified (see 6.2), samples shall be subjected to first article inspection in accordance with 4.4.

3.3 Materials. The caps shall be made of an oil and abrasion resistant elastomeric composition and shall have sufficient resiliency to resist erosion when used to protect fittings during sandblasting operations. Elasticity of the material shall be sufficient to prevent dislodging of the caps during sandblasting operations.

3.3.1 Recycled, recovered, environmentally preferable, or biobased materials. Recycled, recovered, environmentally preferable, or biobased 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.

3.4 Design and construction. Caps shall be designed in accordance with MS24529.

3.4.1 Color. The color shall be optional.

3.5 Performance.

3.5.1 Examination of product. The caps shall conform to the requirements of this specification and the applicable specification sheet when visually examined as specified in 4.7.1.

3.5.1.1 Dimensions. The caps shall be within the tolerances specified on MS24529 when examined as specified in 4.7.2.

3.5.2 Elasticity. Caps when tested for elasticity in accordance with 4.7.4 shall have sufficient elasticity to permit installation on and removal from lubrication fittings in accordance with SAE-AS15000, style 1, 2, or 3 without the use of tools.

3.5.3 Oil resistance. The caps when oil resistance tested in accordance 4.7.5 shall not exhibit deforming, swelling, loss of elasticity or any undesirable change in the physical characteristics of the material.

3.5.4 Abrasion resistance. The caps when tested for abrasion resistance in accordance with 4.7.6, the loss in weight shall not exceed 5% of the original weight of the cap.

3.6 Cleanliness. All caps shall be free of oil, grease, dirt, moisture, cleaning solvents and foreign materials both internally and externally.

3.7 Workmanship. Caps shall be processed in such a manner as to be uniform in quality and shall be free from defects that will affect life, serviceability, and appearance. All surfaces shall be free of bloom, flash, oil, or other harmful foreign matter.

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4. VERIFICATION

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

- a. First article inspection (see 4.4).
- b. Conformance inspection (see 4.5).

4.2 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality and quantity to permit performance of the required inspection shall be used. The establishment and the maintenance of a calibration system to control the accuracy of all test and measuring equipment shall be in accordance with ISO 17025 and NCSL Z540.3, as applicable.

4.3 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in 4.6.

4.4 First article. First article inspection shall be performed at a laboratory acceptable to the Government on sample units produced with equipment and procedures used in production.

4.4.1 Samples for first article. Unless otherwise specified, after award of the contract or order, the manufacturer shall forward three samples. The samples shall be representative of the construction, workmanship, components, and materials to be used during production. When a manufacturer is in continuous production of caps from one contract to another or has demonstrated within the past 2 years the capability to meet the requirements of this specification, inspection of additional first article samples for a new contract may be waived at the discretion of the acquiring activity (see 6.2). Approval of the first article samples or the waiving of first article inspection does not preclude the requirements for performing conformance inspection. First article samples shall be furnished to the Government as directed by the contracting officer (see 6.2).

4.4.2 Inspection routine. The samples shall be subjected to the first article inspections specified in table I and in the specified sequence.

4.4.3 First article test samples. Samples shall be selected in accordance with table III.

4.4.3.1 Failures. One or more failures shall be cause for refusal to grant first article approval.

TABLE I. First article inspections.

Inspection	Requirement paragraph	Test method paragraph
Examination of cap	3.4, 3.5, and 3.7	4.7.1 and 4.7.2
Cleanliness	3.6	4.7.3
Elasticity	3.5.2	4.7.4
Oil resistance	3.5.3	4.7.5
Elasticity	3.5.2	4.7.4
Abrasion resistance	3.5.4	4.7.6

4.4.4 Disposition of first article test samples. First article test samples shall not be supplied as part of the contract or purchase order.

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4.5 Conformance inspection.

4.5.1 Individual tests. Inspection of the product for delivery shall consist of subjecting each cap to the individual tests specified in [table II](#). Any item failing to meet the requirements of the individual test shall be immediately removed from the lot.

4.5.2 Sampling plan for individual inspections. Individual inspections shall be in accordance with [table II](#) and shall be performed on a production lot basis. Samples shall be selected in accordance with [table III](#). If one or more defects are found, the lot shall be screened for that particular defect and defective parts removed. A new sample of parts shall be selected in accordance with [table III](#) and all individual inspections tests again performed. If one or more defects are found in the second sample, the lot shall be rejected and shall not be supplied to this specification.

TABLE II. Individual inspection.

Inspection	Requirement paragraph	Test method paragraph
Examination of caps	3.4 , 3.5 , and 3.7	4.7.1 , 4.7.2
Cleanliness	3.6	4.7.3

TABLE III. Inspection level.

Lot size			Sample size
1	to	8	All
9	to	15	13
16	to	25	13
26	to	50	13
51	to	90	13
91	to	150	13
151	to	280	20
281	to	500	29
501	to	1200	34
1201	to	3200	42
3201	to	10,000	50
10,001	to	35,000	60
35,001	to	150,000	74
150,001	to	500,000	90
500,001	&	over	102

4.5.3 Discontinuation and resumption of production. If there has been no production of caps for a period of 3 years or more, samples, selected in accordance with [table III](#), shall be randomly selected from the first lot produced. The samples shall be subjected to first article inspection, see [table I](#).

4.5.4 Waivers or deviations to specification requirements. All waivers or deviations to specification requirements shall be coordinated through the preparing activity : DLA Land and Maritime, Attn: VAI, P.O. Box 3990, Columbus, Ohio 43218-3990 or e-mailed to FluidFlow@dla.mil

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4.6 Test conditions.

4.6.1 Temperature and pressure. Unless otherwise specified, tests shall be conducted at local ambient temperature and barometric pressure.

4.6.2 Test fluid. Unless otherwise specified, the test fluid used in testing the caps shall be SAE 10 lubricating oil.

4.7 Test methods.

4.7.1 Examination of product. The caps shall be examined for workmanship see 3.7, and whether a lubrication fitting is firmly sealed with a protective device. With documented approval from the acquiring activity, statistical quality control may be used for examination and workmanship.

4.7.2 Dimensions. The caps shall be checked dimensionally to determine conformance to the dimensions specified on MS24529.

4.7.3 Cleanliness. The caps shall be visually examined without magnification both internally and externally for conformance to the requirements specified in 3.6.

4.7.4 Elasticity. Caps shall be inspected for conformance to paragraph 3.5.2 by installing on lubrication fittings in accordance with SAE-AS15000. The caps shall meet the requirements of 3.5.2.

4.7.5 Oil resistance. The test caps shall be immersed in SAE 10 lubricating oil at $104^{\circ}\text{F} \pm 10^{\circ}\text{F}$ ($40^{\circ}\text{C} \pm 5.5^{\circ}\text{C}$) for 1 hour. The caps shall be removed and inspected in accordance with 3.5.3.

4.7.6 Abrasion resistance. The cap shall be abrasion resistance tested and meet the percent weight loss requirement of 3.5.4, the following details shall apply:

- a. The test cap shall be weighed to within 0.01 of a gram and mounted on a lubrication fitting in accordance with SAE-AS15000.
- b. The abrasive material, such as, sharp sand, slag, silicone carbide or aluminum oxide shall be of the following sieve size shown in table IV.

TABLE IV. Sieve size.

Retained on	Specified limits
#8 mesh screen	0 - 0 percent
#12 mesh screen	0 - 5 percent
#16 mesh screen	55 - 100 percent
# 40 mesh screen	0 - 35 percent
# 40 mesh screen	0 - 2 percent

- c. The abrasive shall be directed at the cap for $15 \pm 1/4$ minutes on a 45° angle from the vertical of the nozzle and $3 \pm 1/4$ inches from the nearest surface of the cap.
- d. The temperature of the abrasive shall be $77 \pm 4^{\circ}\text{F}$ ($25 \pm 2^{\circ}\text{C}$).
- e. The air pressure shall be 85 ± 5 psi (586 ± 34 kpa).
- f. The cap shall then be removed and weighed to within 0.01 gram and the percent weight loss in weight determined.

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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 which may be helpful, but is not mandatory).

6.1 Intended use. Caps purchased under this specification are intended for use as a protective device for lubrication fittings during sandblasting and painting operations.

6.1.1 Military unique rationale. The caps covered by this specification are military unique and have to survive oil resistance and abrasion resistance testing of various sizes of abrasives. Commercial equivalents are not required to be exposed to these conditions and would wear causing damage to lubrication fittings.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification and applicable specification sheet.
- b. PIN (see 1.2).
- c. If first article is required (see 3.2).
- d. Name and address of the first article inspection test facility to which first article samples are to be forwarded (see 4.4.1) and the name and address of the Government activity responsible for conducting the first article inspection program (see 6.3).
- e. Packaging requirements (see 5.1).
- f. Shelf life requirements (see 6.2.1).

6.2.1 Shelf life. This specification covers items where the assignment of a Federal shelf-life code is a consideration. Specific shelf-life requirements should be specified in the contract or purchase order, and should include, as a minimum, shelf-life code, shelf-life package markings in accordance with MIL-STD-129 or FED-STD-123, preparation of a materiel quality storage standard for type II (extendible) shelf-life items, and a minimum of 85 percent shelf-life remaining at time of receipt by the Government. These and other requirements, if necessary, are in DoD 4140.27-M, Shelf-life Management Manual. The shelf-life codes are in the Federal Logistics Information System Total Item Record. Additive information for shelf-life management may be obtained from DoD 4140.27-M, or the designated shelf-life Points of Contact (POC). The POC should be contacted in the following order: (1) the Inventory Control Points that manage the item and (2) the DoD Service and Agency administrators for the DoD Shelf-Life Program. Appropriate POCs for the DoD Shelf-Life Program can be contacted through the DoD Shelf-Life Management website: <https://www.shelflife.hq.dla.mil/>.

6.3 First article. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results, and disposition of first article samples. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to

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rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.3.1 Defense Logistics Agency (DLA) waiver of first article test. A waiver of a first article testing will only be considered by DLA when the contractor has delivered the same item within the last 3 years, has no unfavorable quality history, has not changed processes, or changed any subcontractors. DLA will not accept first article testing results outside the stated requirements.

6.4 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. As of the dating of this document, the U.S. Environmental Protection Agency (EPA) is focusing efforts on reducing 31 priority chemicals. The list of chemicals is available on their website at <http://www.epa.gov/osw/hazard/wastemin/priority.htm>. Included in the EPA list of 31 priority chemicals are cadmium, lead, and mercury. Use of the materials on the list should be minimized or eliminated unless needed to meet the requirements specified herein (see section 3).

6.5 Guidance on use of alternative parts with less hazardous or nonhazardous materials. This specification provides for a number of alternative plating materials via the PIN. Users should select the PIN with the least hazardous material that meets the form, fit and function requirements of their application.

6.6 Subject term (key word) listing.

Abrasion resistant
Oil resistant

6.7 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.

CONCLUDING MATERIAL

Custodians:
Army - AR
Navy - YD
DLA - CC

Preparing activity:
DLA - CC

(Project 4730-2015-028)

Review activities:
Navy - MC, SA

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.dla.mil>.