

[INCH-POUND]
WW-C-2928
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SUPERSEDING
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FEDERAL SPECIFICATION

CAPS, FUEL STORAGE TANK

The General Services Administration has authorized the use of this specification for all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers general purpose lock type caps for fuel oil and gasoline storage tanks.

1.2 Classification. Cap shall be of the following types, sizes, and styles, as specified (see 6.2).

TYPES

- Type I - Internal pipe thread for fill-pipe connection.
- Type II - External pipe thread for fill-pipe connection.

SIZES

- Size 1 - 2-inch (51 millimetre (mm)) iron pipe size (ips), National Pipe Taper Thread (NPT).
- Size 2 - 3-inch (76 mm) ips NPT.
- Size 3 - 4-inch (102 mm) ips NPT.

STYLES

- Style A - Vented.
- Style B - Air tight.

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data which may improve this document should be sent to: Commanding Officer (Code 1581), Naval Construction Battalion Center, 1000 23rd Avenue, Port Hueneme, CA 93043-4301, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 5430

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2. APPLICABLE DOCUMENTS

2.1 Government publications. The following documents, of the issues in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

Federal Standard

FED-STD-H28 - Screw Threads for Federal Services Section 7, Pipe Threads, General Purpose.

(Copies of federal standards required by contractors in connection with specific procurement functions are obtained from the Defense Automated Printing Services, Attn: DoDSSP, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

AMERICAN NATIONAL STANDARDS INSTITUTE, INC. (ANSI)

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

(Private sector and civil agencies may purchase copies of these voluntary standards from the American National Standards Institute, Inc., 11 West 42nd Street, New York, NY 10036.)

ASTM

ASTM A 153 - Zinc-Coating (Hot Dip) on Iron and Steel Hardware.

ASTM B 580 - Anodic Oxide Coatings on Aluminum.

(Private sector and civil agencies may purchase copies of these voluntary standards from the American Society for Testing and Materials, 100 Barr Harbor Dr., West Conshohocken, PA 19428-2959.)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 30 - Flammable and Combustible Liquids Code.

(Private sector and civil agencies may purchase copies of these voluntary standards from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.)

(DoD activities may obtain copies of those adopted voluntary standards listed in the DoD Index of Specifications and Standards free of charge from the Defense Automated Printing Services, Attn: DoDSSP, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

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2.3 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 shall take precedence. Nothing in this document, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Standard commercial product. The caps shall, as a minimum, be in accordance with the requirements of this specification and shall be the manufacturer's standard commercial product. Additional or better features which are not specifically prohibited by this specification but which are a part of the manufacturer's standard commercial product, shall be included in the caps being furnished. A standard commercial product is a product which has been sold or is being currently offered for sale on the commercial market through advertisements or manufacturer's catalogs, or brochures, and represents the latest production model.

3.2 First article. When specified (see 6.2), a sample cap shall be subjected to first article inspection (see 4.2.1 and 6.3).

3.3 Materials. Material used shall be free from defects which would adversely affect the performance or maintainability of individual components or for overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term "recovered materials" means material which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. Unless otherwise specified, none of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification.

3.3.1 Cast iron. When specified (see 6.2), the body and cover of the cap shall be iron castings. The castings shall be either gray cast iron, ductile iron, or malleable cast iron conforming to the requirements of this specification and shall be zinc-coated in accordance with ASTM A 153.

3.3.2 Cast aluminum. When specified (see 6.2), the body and cover of the cap shall be aluminum castings conforming to the requirements of this specification and shall be anodized conforming to type A, ASTM B 580.

3.3.3 Cast brass or cast bronze. When specified (see 6.2), the body and cover of the cap shall be either brass or bronze castings conforming to the requirements of this specification.

3.3.4 Synthetic. When specified (see 6.2), the body and cover of the cap shall be a heavy duty, glass filled nylon plastic conforming to the requirements of this specification.

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3.3.5 Iron, brass, bronze or synthetic adapters. The adapter A bushing shall be cast iron, brass, bronze or a synthetic as specified (see 6.2). Unless otherwise specified (see 6.2), the adapter B threaded reducer shall be of cast iron.

3.4 Design.

3.4.1 Type I. The type I cap shall be designed to have internal NPT of the size specified (see 3.4.3 and 6.2), for connecting to a fill pipe.

3.4.2 Type II. The Type II shall be designed to have external NPT of the size specified (see 3.4.3 and 6.2), for connecting to a fill pipe.

3.4.3 Sizes.

3.4.3.1 Size 1. The size 1 shall be designed to fit a standard 2-inch (51 mm) ips fill pipe.

3.4.3.2 Size 2. The size 2 shall be designed to fit a standard 3-inch (76 mm) ips fill pipe.

3.4.3.3 Size 3. The size 3 shall be designed to fit a standard 4-inch (102 mm) ips fill pipe.

3.4.4 Styles. The style A shall be designed to vent to the atmosphere. The style B shall be designed to be airtight and nonvented. The style of the cap shall be as specified (see 6.2).

3.4.5 Adapters.

3.4.5.1 Adapters A. When specified (see 6.2), an adapter A (bushing) shall be provided. The bushing shall be designed to adapt a 1.5-inch (38 mm) ips fill pipe to a type I, size 1 cap.

3.4.5.2 Adapter B. When specified (see 6.2), and adapter B (threaded reducer) shall be provided. The threaded reducer shall be designed to adapt a 1.5-inch (38 mm) ips fill pipe to a type II, size 1 fill cap.

3.5 Construction.

3.5.1 Style A. The body of the cap shall have a hinge lug and an eye lug positioned at opposite sides. The cover of the cap shall be permanently joined to the body by a hinge pin proportionate to the size of the cap. The hinge pin shall be peened or enlarged to prevent removal. The pin shall be of stainless steel or other corrosion-resistant metal of strength equal to the hinge and eye lug. The hinge bearing holes shall be accurately aligned. The lug of the cover shall fit the lug of the body in such a manner that a padlock with a shackle of not less than 0.375-inch (10 mm) in diameter passed through the eye shall prevent the cover from being opened. The body shall be vented at the rim, and the sides of the cover shall overlap the sides of the body to prevent entry of rain falling at a 45-degree angle from vertical. The body shall be threaded at the base for threading onto a fill pipe as specified for types I and II. Threads shall be as specified in 3.6. Flat surfaces or lugs shall be provided on the outside periphery of the body for use of smooth jaw or

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spanner wrenches for tightening. Unless otherwise specified (see 6.2), the cap and body shall conform to NFPA 30 requirements for vented fill caps.

3.5.2 Style B. Closing the cap shall be by either cam or lever, screw-on, or mating twist-lock lugs. The body of the cap shall provide a sealing surface; cam grooves, threads, notches, flanges, or lugs to receive the lid with mating parts. To facilitate locking, matching eyes on the lid and the body shall be provided to receive a padlock with a shackle of not less than 0.375-inch (10 mm) in diameter. The sealing gasket provided shall be Buna-N for gasoline and diesel fuel tanks and Viton-A for jet fuel tanks and shall provide an air-tight seal when the cap is closed and locked. Where cams and cam levers are used, the cam levers shall be of corrosion-resistant steel or high-strength brass compatible with the mating parts. Cam lever hinge pins shall be of stainless steel or other corrosion-resistant metal of strength equal to the lever hinge eye. The hinge pin shall be peened or enlarged to prevent removal. The body shall be threaded at the base for threading onto a fill pipe as specified for types I and II. Threads shall be as specified in 3.6. The cap and body construction shall have a pressure rating of not less than 5 pound-force per square inch (psi) (34 kPa) and not greater than 9 psi (62 kPa). Unless otherwise specified (see 6.2), the cap and body shall conform to NFPA 30 requirements for air-tight fill caps.

3.5.3 Adapter A. The adapter A bushing shall be hexagon with 1.5-inch (38 mm) internal pipe threads NPT and 2-inch (51 mm) external pipe threads NPT. Threads shall be as specified in 3.6. The pressure rating of the bushing shall be not less than 5 psi (34 kPa) and not greater than 9 psi (62 kPa).

3.5.4 Adapter B. The adapter B threaded reducer shall have 1.5-inch (38 mm) internal pipe threads NPT at one end and 2-inch (51 mm) internal pipe threads NPT at the opposite end. Threads shall be as specified in 3.6. The pressure rating of the reducer shall be not less than 5 psi (34 kPa) and not greater than 9 psi (62 kPa). When the reducer is fabricated from cast iron, it shall be zinc-coated by the hot-dip process in accordance with ASTM A153, and shall be so treated as to be thoroughly coated with a smooth, bright adherent solid surface of zinc. The fitting shall be zinc-coated both inside and outside. The fitting shall be coated before threading.

3.6 Threads. All threads shall be right hand and shall be smooth, clean, and true to form. All threads shall conform to FED-STD-H28 for NPT, except for the manufacture's selection of threads for a screw-on cap to the body.

3.7 Performance.

3.7.1 Pressure.

3.7.1.1 Style B caps. The style B caps shall be capable of withstanding pressure of not less than 5 psi (34 kPa) and not greater than 9 psi (62 kPa).

3.7.1.2 Adapters. The adapter A and adapter B shall be capable of withstanding pressure of not less than 5 psi (34 kPa) and not greater than 9 psi (62 kPa) (see 4.6.1 and 4.6.2).

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3.8 Identification marking. Identification shall be permanently and legibly marked directly on the cap or on a corrosion-resisting metal plate securely attached to the cap at the source of manufacture. Identification shall include the manufacturer's model and serial number, name and trademark to be readily identifiable to the manufacturer.

3.9 Workmanship. All sharp edges and corners shall be removed. All sealing surfaces and mating parts shall fit without binding and be properly aligned. All cam surfaces and mating grooves shall be dressed to provide smooth and easy operation. All mating locking eye and lugs shall be dressed to eliminate sharp or rough surfaces and be properly aligned.

3.9.1 Welding. Welding procedures shall be in accordance with a nationally recognized welding code. The surface of parts to be welded shall be free from rust, scale, paint, grease, or other foreign matter. Welds shall be of sufficient size and shape to develop the full strength of the parts connected by the welds. Welds shall transmit stress without permanent deformation or failure when the parts connected by the weld are subjected to proof and service loadings.

3.9.2 Castings. All castings shall be sound and free from patching, misplaced coring, warping, or any other defect which reduces the castings ability to perform its intended function.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification, where such inspections are deemed necessary to ensure that supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of section 3 and 5. The inspection set forth in this document shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in this document shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements specified herein and in applicable referenced documents.

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

- a. First article inspection (see 4.2.1).
- b. Quality conformance inspection (see 4.2.2).

4.2.1 First article inspection. The first article inspection shall be performed on one complete cap when a first article is required (see 3.2 and 6.2). This inspection shall include the examination of 4.4 and the test of 4.5.1 (see 6.2). The first article may be either a first production item or a standard production item from the supplier's current inventory provided the item meets the requirements of the specification and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract.

4.2.2 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.4 and the test of 4.5.2. This inspection shall be performed on the samples selected in accordance with 4.3.

4.3 Sampling. Sampling and inspection procedures shall be in accordance with ANSI-Z1.4. The unit of product shall be one complete cap. All caps offered for delivery at one time shall be considered a lot for the purposes of inspection. If an inspection lot is rejected, the contractor may rework it to correct the defects, or screen out the defective units and resubmit for a complete reinspection. Resubmitted lots shall be reinspected using tightened inspection. If the rejected lot was screened, reinspection shall be limited to the defect causing rejection. If the lot was reprocessed, reinspection shall be performed for all defects. Rejected lots shall be separate from new lots, and shall be clearly identified as reinspected lots.

4.3.1 Sampling for examination. Examination shall be based on inspection level II and an Acceptable Quality Level (AQL) of 2.5 percent defective.

4.3.2 Sampling for tests. Tests shall be based on inspection level S-3 and AQL of 4.0 percent defective.

4.4 Examination. Each cap selected in accordance with 4.3 shall be examined for compliance with the requirements in section 3 of this specification. Any redesign or modification of the contractor's standard product to comply with specified requirements, or any necessary redesign or modification following failure to meet specified requirements shall receive particular attention for adequacy and suitability. This element of inspection shall encompass all visual examinations and dimensional measurements. Noncompliance with any specified requirements or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

4.5 Tests.

4.5.1 First article tests. The first article sample shall receive the tests of 4.6 when a style B cap and adapters A or B are being furnished. Failure of the first article to pass any of the test shall constitute cause for rejection.

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4.5.2 Quality conformance tests. Each sample of style B caps and adapter A or adapter B, selected in accordance with 4.3, shall receive the test of 4.6.1 or 4.6.2 as applicable. Failure to pass the applicable test shall be cause for rejection of the lot.

4.6 Test methods.

4.6.1 Air pressure test. Selected samples of the style B caps, adapter A, and adapter B shall be subject to an air-pressure test of not less than 5 psi (34 kPa) and not greater than 9 psi (62 kPa) while the sample(s) are under water or under another suitable medium. The sample(s) shall not leak air at any part of the surface.

4.6.2 Alternate pressure test. As an alternate test, not less than 5 psi (34 kPa) and not greater than 9 psi (62 kPa) pressure rated sample(s) may be subjected to a hydrostatic pressure test of not less than 5 psi (34 kPa) and not greater than 9 psi (62 kPa) for not less than 1 minute. Under the hydrostatic pressure test, the sample(s) shall not leak or sweat at any part of the surface.

5. PACKAGING

5.1 Packaging requirements. The preservation, packing, and marking shall be as specified in the contract or order.

6. NOTES

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

6.1 Intended use. The caps are intended for use on diesel, gasoline, and jet fuel storage tank fill pipes. The style A vented cap is primarily for diesel fuel. The style B air-tight caps are for gasoline or jet fuel. The caps are also intended to provide some security to prevent tampering with fuel supplies; reduce fire hazards, fuel contamination, and vapor emission.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Number and type, size, style, and adapter required (see 1.2, 3.4.1, 3.4.2, and 3.4.4)
- c. When first article sample is required (see 3.2 and 4.2.1).
- d. Type of material required for the caps (see 3.3.1, 3.3.2, and 3.3.3).
- e. Type of material for the adapter A bushing (see 3.3.4).
- f. Material required for the adapter B threaded reducer, if other than cast iron (see 3.3.4).
- g. When an adapter A bushing is required for type I, size 1 cap (see 3.4.5.1).
- h. When an adapter B threaded reducer is required for the type II, size 1 cap (see 3.4.5.2).
- i. When the styles A and B caps are to conform to other than NFPA 30 requirements (see 3.5.1 and 3.5.2).

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6.7 Subject term (key word) listing.

Air tight
Caps, gasoline, diesel, and jet fuel storage tank
Vented

6.8 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes involved.

MILITARY INTERESTS:

CIVIL AGENCY COORDINATING ACTIVITY:
GSA-FSS

Custodians:

Navy - YD1
Air Force - 99

Preparing Activity:

Navy - YD1

(Project 5430-0247)

Review Activities:

Air Force - 84
DLA - CS