

INCH-POUND
MIL-DTL-52618F
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SUPERSEDING
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DETAIL SPECIFICATION

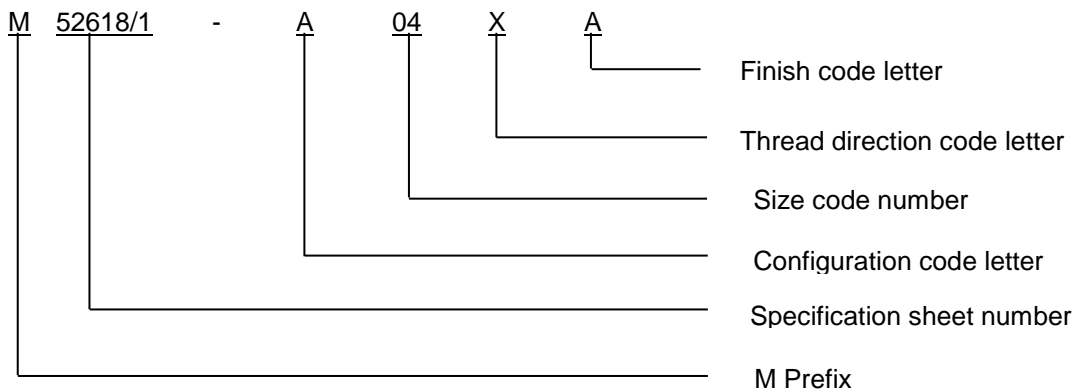
FITTINGS, PIPE, ALUMINUM-ALLOY THREADED, 150-POUND, GENERAL SPECIFICATION FOR

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

1 SCOPE

1.1 Scope. This specification covers aluminum-alloy threaded pipe fittings, 150-pound class.

1.2 Part or Identifying Number (PIN). The PIN consists of the letter M, the specification number, a dash, letter for configuration, a number for fitting size, a letter for thread direction, and a letter for finish type.



PIN example: M52618/1-A04XA indicates a 90° elbow for a 1/2 inch pipe, right hand threads, and finish is "as cast".

Comments, suggestions, or questions on this document should be addressed to: DLA Land and Maritime, Attn: VAI, P.O. Box 3990, Columbus, OH 43218-3990, or emailed to FluidFlow@dla.mil. 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>.

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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 documents cited in sections 3, 4, or 5 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 SPECIFICATION

MIL-A-8625 - Anodic Coatings for Aluminum and Aluminum Alloys.

DEPARTMENT OF DEFENSE STANDARD

MIL-STD-130 - Identification Marking of US Military Property.

(See supplement 1 for list of specification sheets.)

(Copies of these documents are available online at <https://assist.daps.dla.mil/quicksearch/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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.

ASME INTERNATIONAL

ASME B1.20.1 - Pipe Threads, General Purpose (Inch)
ASME B16.3 - Malleable Iron Threaded Fittings Classes 150 and 300

(Copies of these documents are available online at <http://www.asme.org> or from the ASME International, Three Park Avenue, New York, NY 10016-5990.)

ASTM INTERNATIONAL

ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings
ASTM B108/B108M - Standard Specification for Aluminum-Alloy Permanent Mold Castings
ASTM B210 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes
ASTM B211 - Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire
ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

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(Copies of these documents are available online at <http://www.astm.org> or from the ASTM International, P.O. Box C700, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

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 www.ansi.org or from the ANSI Customer Service Department, 25 W. 43rd Street, 4th Floor, New York, NY 10036.)

NATIONAL CONFERENCE OF STANDARDS LABORATORIES (NCSL)

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.)

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.

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 Description. The threaded aluminum pipe fittings, hereinafter referred to as "fittings" shall be of the 150-pound class. Fittings specified herein shall include crosses, tees, 90° and 45° elbows, couplings, reducers, return bends, reducing crosses, tees and elbows, caps, plugs, bushings, and street elbows.

3.2.1 Intended use. Intended use is with water, oil, or air 150 psi (1.03 MPa) max at 72°F (22°C).

3.3 Material. Material shall be as specified herein. Materials not specified shall be selected by the contractor and shall be subject to all provisions of this specification.

3.3.1 Recovered materials. For the purpose of this requirement, recovered materials are those materials that have been collected from solid waste and reprocessed to become a source of raw materials, as distinguished from virgin raw materials. The components, pieces and parts incorporated in the fittings may be newly fabricated from recovered materials to the maximum extent practicable, provided the fittings produced meets all other requirements of this specification. Used, rebuilt or remanufactured components, pieces and parts shall not be incorporated in the fittings.

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3.3.2 Fabrication. The fittings shall be fabricated from aluminum-alloy castings in accordance with ASTM B26/B26M or ASTM B108/B108M, alloy 356.0-T6, except that the fittings listed below shall be aluminum fabricated from wrought products indicated herein:

- a. All fittings, size 1/4 inch through 1 inch, shall be drawn aluminum tube in accordance with ASTM B210 alloy 6061-T6.
- b. All fittings, size 1-1/4 inch through 4 inches, shall be extruded aluminum tube in accordance with ASTM B221 alloy 6061-T6.
- c. All plugs, size 1/8 inch through 1/2 inch, shall be aluminum rod in accordance with ASTM B211 alloy 6061-T6.

3.4 Design and dimensions. Fittings shall be in accordance with the applicable specification sheets, see supplement 1.

3.4.1 Design and tolerances. The design and tolerances of the fittings shall be in accordance as specified herein and applicable specification sheets.

3.4.2 Threads. All threads shall be in accordance with American National Standard Taper Pipe Thread (NPT) in accordance with ASME B1.20.1, except that couplings, wrought caps, and wrought bushings in sizes 1/2 inch and under may be American National Standard Straight Pipe (NPSC) thread in accordance with ASME B1.20.1. Thread length, depth, variation in alignment, countersinking, and chamfering shall be as specified in ASME B16.3.

3.5 Proof pressure. The fittings shall withstand an internal air pressure of 90 pounds per square inch gauge (psig) (0.62 MPa) and an internal hydrostatic pressure of 250 psig (1.72 MPa) without leaking or sweating (see 4.5.3).

3.6 Finish. When specified (see 6.2), fittings shall be anodized in accordance with MIL-A-8625, type II, class 1, thickness no less than 0.0004 inch (10 μ m) for castings and no less than 0.0007 inch (18 μ m) for wrought products.

3.7 Identification marking. The pipe fittings shall be identified and marked in accordance with MIL-STD-130.

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

3.9 Workmanship. The finish of cast and extruded fittings shall be workmanlike and free of burrs, sharp edges, and corners. The fittings shall be free of sand and scale, inclusions, fins, gate protrusions, cracks, shrinks, and other injurious defects. There shall be no cold shunts, blowholes, porosity, or any other defects that may affect serviceability.

4. VERIFICATION

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

- a. First article inspection (see 4.3)
- b. Conformance inspection (see 4.4).

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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 established and maintained or identified by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with ISO 17025 and NCSL Z540.3 as applicable.

4.2.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, 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 assure supplies and services conform to prescribed requirements.

4.2.3 Lot records. Manufacturers shall keep lot records for 3 years minimum. Manufacturers shall monitor for compliance to the prescribed procedures, and observe that satisfactory manufacturing conditions and records on lots are maintained for these fittings. The records, including as a minimum, an attributes summary of all quality conformance inspections conducted on each lot, shall be available to review by customers at all times

4.3 First article inspection. When specified in the contract or purchase order (see 6.2), samples that are representative of the production item shall be subjected to first article inspection after the Government has awarded the contract. First article inspection shall be performed in accordance with table I to determine whether the production items meet the requirements of this specification.

TABLE I First article inspection.

Test	Requirement paragraph	Test paragraph
Visual	3.1, 3.3.2, 3.4, 3.6, 3.7, 3.8, and 3.9	4.5.1
Threads	3.4.2	4.5.2
Proof test (Air)	3.5	4.5.3.1
Proof test (Hydrostatic)	3.5	4.5.3.2
Finish	3.6	4.6

4.3.1 Responsibility for compliance. All items shall meet all requirements of sections 3, 4, or 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system. The absence of any inspection requirements in the specification 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 acceptance of defective material.

4.3.1.1 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, OH 43218-3990, or emailed to Fluidflow@dla.mil.

4.3.1.2 Failures. All samples shall meet all of the contract requirements. Failure of a sample unit to pass any test shall be cause for rejection of the entire lot and refusal to grant first article approval.

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4.3.2 Disposition of first article samples. Unless otherwise specified, after award of the contract or order, the manufacturer shall forward one fitting, selected randomly from a sample lot. The sample shall be representative of the construction, workmanship, components, and materials to be used during production. When a manufacturer is in continuous production fittings from one contract to another, submission of additional first article samples for a new contract may be waived at the discretion of the acquiring activity (see 6.2).

4.3.3 First article information. Upon completion of first article inspection, the Government activity responsible for conducting the inspection program (see 6.2), shall report the results of the inspection, with appropriate recommendation, to the contracting officer. Approval of the first article samples or the waiving of first article inspection does not preclude the requirements for performing conformance inspection.

4.4 Conformance inspection. Conformance inspection shall consist of the examinations and tests specified in table III performed on individual products or lot samples to determine conformance of the products or lots with the requirements of this specification.

4.4.1 Sample size. Sampling for examination and tests shall be in accordance with table II. The sample shall be taken at random from a production run and shall be produced with equipment and procedures normally used in production. A lot shall be accepted when 0 defects are found, and rejected when 1 or more defects are found.

TABLE II. Inspection sample.

Production lot size	Sample size
1	1
2 to 8	2
9 to 15	3
16 to 25	5
26 to 50	8
51 to 90	13
91 to 150	20
151 to 280	32
281 to 500	50
501 to 1,200	80
1201 to 3,200	125
3201 to 10,000	200
10,001 to 35,000	315

4.4.2 Individual inspection. For manufacturers that have successfully passed first article inspections and are continuously producing fittings to this specification, ongoing inspections shall consist of individual inspections, see table III. Each production of fittings shall be subjected to the examinations and tests in accordance with table III.

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TABLE III. Individual inspections.

Test	Requirement paragraph	Test paragraph
Visual	3.1 , 3.3.2 , 3.4 , 3.6 , 3.7 , 3.8 , and 3.9	4.5.1
Threads	3.4.2	4.5.2

4.4.3 Inspection lot. An inspection lot shall consist of all fittings covered by a single specification sheet produced under essentially the same conditions and offered for inspection at one time.

4.5 Test methods.

4.5.1 Visual inspection. Fittings shall be examined to ensure conformance with this specification. Continuous examination shall be performed to assure compliance with the following requirements:

- a. Specification sheets (see [3.1](#)).
- b. Design, construction and physical dimensions (see [3.4](#)).
- c. Materials (see [3.3.2](#)) and finishes (see [3.6](#)).
- d. Marking (see [3.7](#)).
- e. Cleanliness (see [3.8](#)).
- f. Workmanship (see [3.9](#)).

4.5.2 Threads. Fittings selected from the sample shall be inspected for conformance with ASME B1.20.1.

4.5.3 Proof pressure tests (see [3.5](#)). Fittings selected from the sample lot shall be subjected to air proof pressure test and hydrostatic proof pressure test.

4.5.3.1 Air proof pressure test. Each of the sample fittings selected shall be subjected to an air pressure test at normal plant air pressure of at least 90 psig (0.62 MPa) for a length of time sufficient for an examination for leaks, but not less than one minute. Any evidence of air leakage shall constitute failure of this test.

4.5.3.2 Hydrostatic proof pressure test. Sample pipe fittings shall be subjected to a hydrostatic pressure of 250 psig (1.72 MPa) for 1 minute. Any evidence of leakage or sweating shall constitute failure of this test.

4.6 Finish (see [3.6](#)). When specified (see [6.2](#)), the finish type and thickness shall be verified in accordance with MIL-A-8625.

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 material 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 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.

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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 aluminum fittings are primarily intended for use with threaded aluminum piping in water or liquid petroleum product service. These fittings are military unique because they must withstand a hydrostatic proof pressure of 250 psi (1.72 MPa), commercial fittings are not designed to withstand this pressure.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. PIN (see 1.2)
- c. First article (see 4.3) or whether first article inspection is waived (6.3.1).
- d. Lot records if required (see 4.2.3).
- e. Name and address of the first article inspection test facility to which first article samples, if required, are to be forwarded (see 4.2.3) and the name and address of the Government activity responsible for conducting the first article inspection program (see 6.3).
- f. Finish, if required see 3.6.
- g. Any special marking required (see 3.7, 5.1, and 6.5).
- h. Packaging (see 5.1).

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 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 three 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/epawaste/hazard/wastemin/index.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 PIN. The PIN to be used for pipe fittings acquired to this specification is to be in accordance with the applicable specification sheets (MIL-DTL-52618/1 through MIL-DTL-52618/9).

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6.6 Subject term (key word) listing.

Bushings
Caps
Couplings
Crosses
Elbows
Reducers
Street elbows
Tees

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 - AT
Navy - AS
DLA - CC

Preparing activity:

DLA - CC

(Project 4730-2011-041)

Review activities:

Army - CE
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.daps.dla.mil>.