

INCH-POUND

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13 November 2018
SUPERSEDING
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20 October 1983

MILITARY SPECIFICATION

NOZZLES, FIRE HOSE, WATER: SPRAY AND STREAM

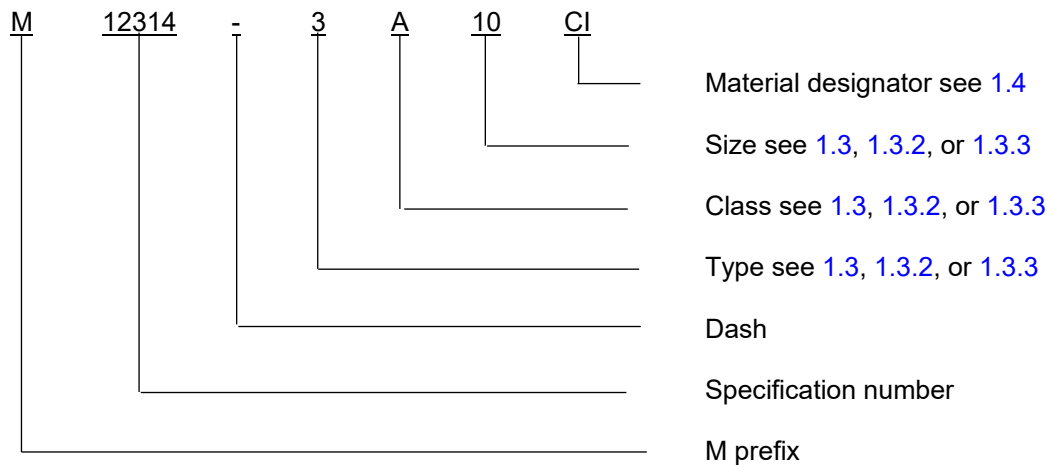
Inactive for new design after 10 April 1998

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

1. SCOPE

1.1 Scope. This specification covers fire hose water nozzles for connecting to fire hose or playpipe.

1.2 Part of identifying Number (PIN). The pin consists of the letter M, specification number, a dash, number for type, a letter(s) for class and additional features, a number for size and a letter(s) for material designator.



1.3 Classification. The water nozzles are of the following types, classes, and size, as specified:

1.3.1 Type I. Revolving, cellar, 2-1/2 inch, see 3.10, designator 1R40

Comments, suggestions, or questions on this document should be addressed to: DLA Land and Maritime, Columbus, Attn: DSCC-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.dla.mil>.



1.3.2 Type II. Combination spray and stream, designator, types, and sizes see 3.11 and table I.

TABLE I. Type II - Combination spray and stream designators.

Type II - Class A Adjustable	
Designator	Size
2A16	1 inch
2A24	1-1/2 inch
2A40	2-1/2 inch

Type II - Class B Non-adjustable		
Designator	Size	Tip opening applicator length
2B16	1 inch	¼-inch tip 4-foot applicator
2B24	1-1/2 inch	½-inch tip 10-foot applicator
2B40	2-1/2 inch	1 inch tip 10-foot applicator

Type II - Class C Nonadjustable, high pressure	
Designator	Size
2C8	1 inch

1.3.3 Type III. Solid stream, designator, types, and sizes, see 3.12 and table II.

TABLE II. Type III nozzle designators.

Type III - Solid stream Class A Plain		
Designator	Size	Tip opening
3A6	1-1/2 inch	3/8-inch
3A8	1-1/2 inch	1/2-inch
3A10	1-1/2 inch	5/8-inch
3A16	2-1/2 inch	1 inch

Type III - Solid stream Class B Shut off		
Designator	Size	External threads
3B16	1 inch	1 - 8 NH
3B24	1-1/2 inch	
3B40	2-1/2 inch	
Playpipe		
3BP40	2-1/2 inch	1 ½ - 9 NH
3C24	1-1/2 inch	
3C40	2-1/2 inch	
Playpipe		
3CP40	2-1/2 inch	

1.4 Material designators:

Blank - Brass see 3.3.5

A - Cast aluminum see 3.3.4

CI - Cast iron see 3.3.3

2 APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 or 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 had been made to ensure the completeness of the list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 or 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 listed in the solicitation or contract.

COMMERCIAL ITEM DESCRIPTIONS

A-A-59438 - Playpipe: Nozzle, Fire Hose

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-PRF-81733 - Sealing and Coating Compound, Corrosion Inhibitive
MIL-PRF-23377 - Primer Coatings: Epoxy, High-Solids

DEPARTMENT OF DEFENSE STANDARDS

FED-STD-H28/10 - Screw Thread Standards for Federal Services, Section 10, American National Hose Couplings and Fire-Hose Coupling Threads

MILITARY

MIL-STD-130 - Identification Marking of US Military Property
MIL-STD-889 - Dissimilar Metals

(Copies of these documents are available online at <https://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.

ASTM INTERNATIONAL

ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings
ASTM A519/A519M - Standard Specification for Seamless Carbon and Alloy Steel Mechanical Tubing
ASTM B16/B16M - Standard Specification for Free-Cutting Brass Rod, Bar and Shapes for Use in Screw Machines
ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings
ASTM B108/B108M - Standard Specification for Aluminum-Alloy Permanent Mold Castings
ASTM B124/B124M - Standard Specification for Copper and Copper Alloy Forging Rod, Bar, and Shapes
ASTM B210 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes

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ASTM B584 - Standard Specification for Copper Alloy Sand Castings for General Applications

(Copies of these documents are available online at <https://www.astm.org>.)

SAE INTERNATIONAL

SAE-AMS-QQ-P-416 - Cadmium Plating (Electrodeposited)

(Copies of this document is available online at <https://www.sae.org>.)

2.4 Order of precedence. Unless otherwise noted here in 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 Description. The individual item requirements shall be as specified herein. The nozzles shall provide either a continuous stream or a combination spray and stream under specified pressures and rate of flow. The nozzles shall be similar to the nozzles shown in figures 1 through 5 (see 6.5).

3.2 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 4.3 and 6.3).

3.3 Materials. Materials 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 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.

3.3.1.1 Recovered materials. The term "recovered materials" means materials, which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as mean that the use of used or rebuilt products is allowed under this specification.

3.3.2 Material deterioration and control. The nozzle shall be fabricated from compatible materials, inherently corrosion and deterioration resistant or treated to provide protection against the various form of corrosion and deterioration that may be encountered in any of the applicable storage and operating environment to which the nozzle may be exposed.

3.3.2.1 Dissimilar metals. Dissimilar metals, as defined in MIL-STD-889, shall be electrically insulated from one another to minimize or prevent galvanic corrosion. Insulation may be provided by an insulating barrier such as a coat of epoxy primer conforming to MIL-PRF-23377, or corrosion inhibiting sealant conforming to MIL-PRF-81733. Protection against any galvanic corrosion could also be obtained by exclusion of the electrolyte if feasible.

3.3.2.2 Identification of materials and finishes. The contractor shall identify the specific material, material finish or treatment for use with components and sub-components, and shall make information available, upon request, to the contracting officer or designated representative.

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3.3.3 Malleable cast iron. Malleable iron castings for nozzles shall conform to ASTM A47/A47M, grade 32510.

3.3.4 Cast aluminum. Aluminum castings for nozzles shall conform to ASTM B26/B26M or ASTM B108/B108M, Alloy UNS A03560, T6.

3.3.5 Brass.

3.3.5.1 Brass bars. Brass bars shall conform to ASTM B16/B16M. Drop forged brass shall conform to ASTM B124/B124M, Alloy UNS C37700.

3.3.5.2 Cast brass. Brass castings shall conform to ASTM B584, Alloy UNS C83600 or UNS C84400.

3.3.6 Aluminum tubing. Aluminum tubing shall conform to ASTM B210, Alloy 6061, temper to suit application.

3.3.7 Steel tubing. Steel tubing shall conform to ASTM A519/A519M, type, grade and finish to suit application.

3.3.8 Gaskets. Gaskets shall be furnished on all nozzles equipped with internal threads.

3.4 Threads. All threads shall be American National Fire Hose Coupling Threads (NH/NST) conforming to FED-STD-H28/10, see 6.5.

3.5 Design. The nozzles shall be aluminum, brass, malleable cast iron, or steel as specified (see 3.5.1 and 6.2). The nozzles shall have one end internally threaded for connecting to a fire hose or to a playpipe. Lugs, when provided, shall be the rocker-lug type.

3.5.1 Component and material inspection. The contractor is responsible for insuring that components and materials used are manufactured, examined, and tested in accordance with referenced specifications and standards, as applicable.

3.6 Environmental conditions.

3.6.1 Operating temperature. All moving parts of the nozzles shall be free moving and nonbinding under normal operating conditions in any ambient temperature from -25°F to +110°F.

3.6.2 Storage temperature. The nozzle assembly shall not be damaged by storage in any ambient temperature from -28°F to +145°F.

3.7 Hydrostatic pressure. The nozzles shall withstand an internal hydrostatic pressure of 500 pounds per square inch (psi), except that type II, class C nozzles shall withstand 1000 psi, without damage or physical distortion to the body of the nozzles which might impair its serviceability.

3.8 Finish. All ferrous surfaces, including threaded and sliding surfaces, shall be cadmium plated in accordance with SAE-AMS-QQ-P-416, class I, type II.

3.9 Identification marking. When specified (see 6.2), each nozzle shall be identified in accordance with MIL-STD-130. Marking shall be placed in a conspicuous location on the body of the nozzle.

3.10 Type I, revolving, cellar, 2-1/2 inch. Type I, revolving, cellar, 2-1/2 inch the flowing details shall apply:

- a. The nozzle shall consist of a revolving barrel having not less than six machined orifices set at different angles, and not less than two water-stream orifices of different sizes so positioned as to cause the barrel to rotate when the nozzle is in operation.
- b. The barrel shall rotate on enclosed ball bearings which shall insure free-moving and nonbinding operation at a nozzle pressure of 100 psi.
- c. The revolving cellar nozzle shall be such shape and size as to pass through a 6-inch circular opening and shall be similar to [figure 1](#).
- d. The nozzle shall discharge not less than 280 gallons per minute (gpm) of water at a pressure of 100 psi.
- e. The nozzle shall weigh not more than 9 pounds.
- f. The inlet connection shall have 2 ½ - 7 ½ NH internal threads.
- g. The overall length of the nozzle shall be not less than 7 inches.

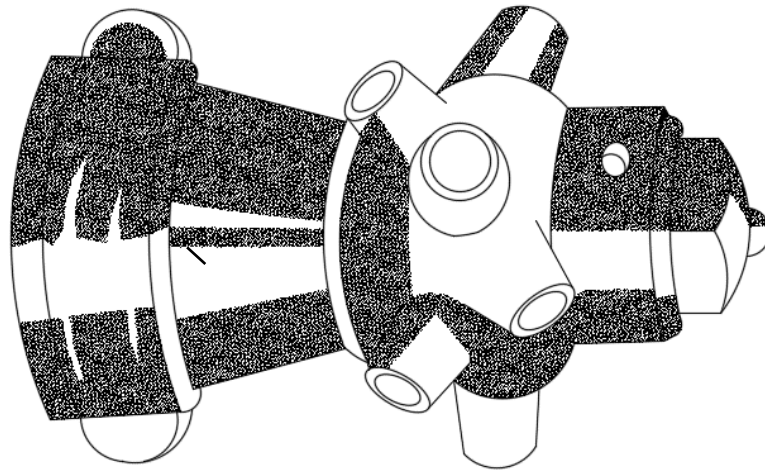


FIGURE 1. Type I.

3.11 Type II, combination spray and stream.

3.11.1 Class A, adjustable. The adjustable nozzle shall have a control mechanism capable of producing a continuous stream varying from a solid stream to a conical fog pattern and an adjustable gallons flow mechanism to control water discharge. The nozzle tip shall be equipped with a natural rubber or synthetic rubber ring. The nozzle shall be of the weight and flow characteristics shown in [table III](#).

TABLE III. Weight and flow characteristics.

Internal thread Size (inches)	Weight (brass) (pounds)		Flow characteristics (discharge pressure, 100 psi)	
			Straight stream (gpm)	Spray (fog) (gpm)
	Minimum	Maximum	Minimum	Minimum
1	2	4-3/4	12	12
1-1/2	2-1/2	6-3/4	95	95
2-1/2	4	11-1/2	120	120

3.11.1.1 Size 1-inch nozzle. The control mechanism shall operate smoothly at pressures up to 400 psi and shall provide a continuous change from straight stream to conical water fog pattern at any angle up to 140 degrees. The shutoff valve shall not leak more than 0.5 percent of specified minimum discharge at 100 psi. The butt end of the nozzle shall have 1-8 NH internal threads.

3.11.1.2 Size 1-1/2 inch and 2-1/2 inch nozzle. The control mechanism shall operate smoothly at pressures up to 150 psi and shall provide a continuous change from straight stream to conical water fog pattern at any angle up to 140 degrees. The shutoff valve shall not leak more than 0.5 percent of specified minimum discharge at 100 psi. The butt end of the nozzles shall have 1 ½ - 9 NH and 2 ½ - 7 ½ NH internal threads, as applicable.

3.11.2 Class B, nonadjustable. The nonadjustable nozzle discharge end shall conform to [figure 3](#) and as specified herein.

- a. The nozzle shall be similar to that shown in [figure 2](#).
- b. The nozzles shall be shutoff type and shall have two waterways between the shutoff valve and the tip.
- c. One waterway shall lead to a solid stream opening and the other to a removable spray-head opening. The design shall be such that there will be an enlarged water chamber in the spray-head-opening waterway, which will lessen water turbulence and reduce friction loss.
- d. The valve mechanism shall be operated by means of a D-frame or horseshoe-type handle with ball-type stops at each of the following three positions: Beginning at the front, the positions shall be marked (1) "SHUT" (2) "FOG" or "SPRAY" (3) "OPEN" or "STREAM" in that order.
- e. In the "SHUT" position, there shall be no flow through the nozzle at the pressures specified; in the "FOG" or "SPRAY" position, water shall be delivered to the spray-head opening; in the "OPEN" or "STREAM" position, water shall be delivered to the solid-stream opening.
- f. The nozzle shall operate at pressures up to 500 psi under seawater conditions.

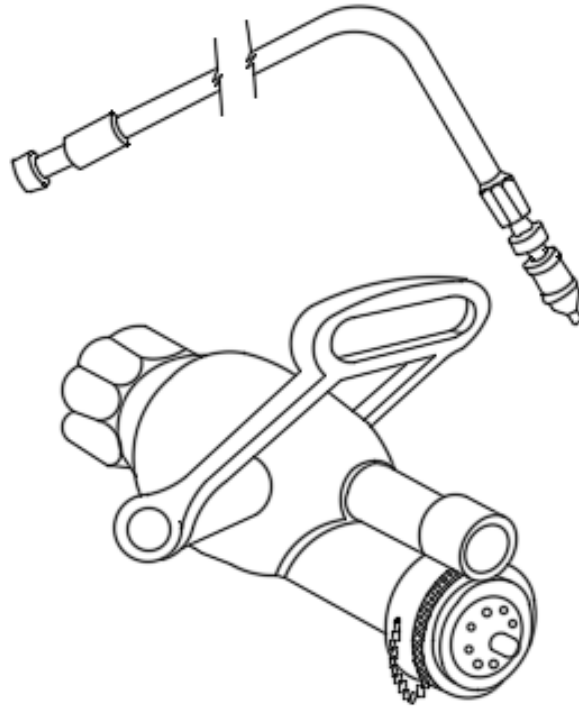
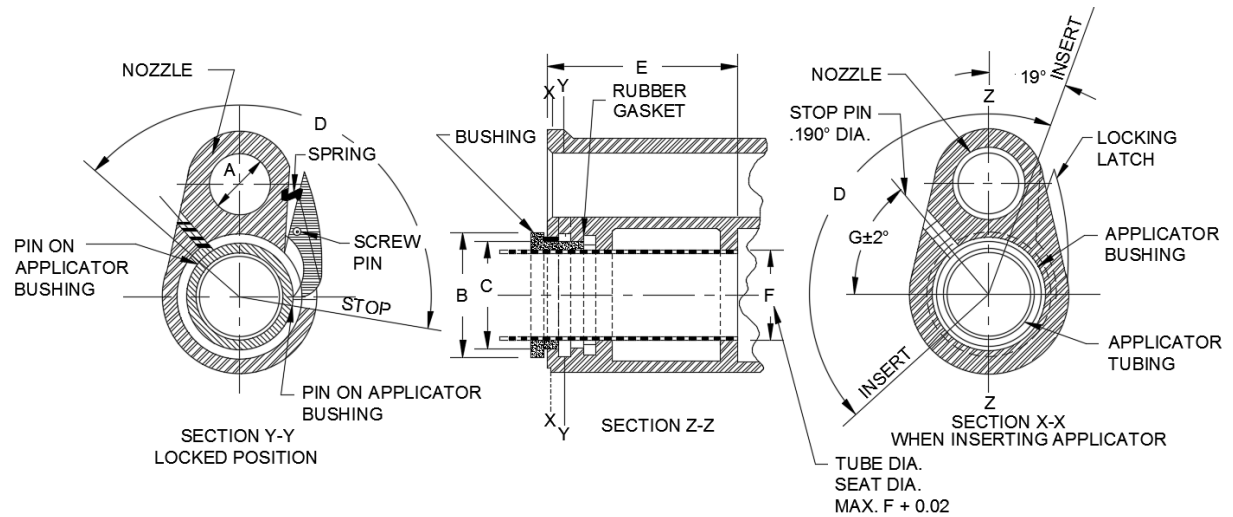


FIGURE 2. Type II, class B.

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Size	A	B	C	D	E	F	G
1	.25	1.38	1.19	150°	2.50	1.00	54°
1-1/2	.50	1.91	1.75	150°	3.28	1.25	54°
2-1/2	1.00	1.91	1.75	165°	3.50	1.50	38°

NOTES

1. Dimensions are inches.
2. Features not dimensioned are optional.
3. Applicator tubing with 1 inch or less outside diameter shall have wall thickness of .049 inches.
4. Applicator tubing with outside diameter greater than 1 inch shall have wall thickness of .065 inch.
5. Tubing may be reduced as much as .25 inch below that specified.

FIGURE 3. Nozzle, type II, class B, 1-inch, 1-1/2-inch, and 2-1/2-inch sizes.

3.11.2.1 Shutoff valve. The shutoff valve shall be full-flow, ball (single or double seat type), or cylindrical floating-gland type with ground joints. The floating gland shall operate by pressure through bypasses in the body of the ball or cylinder. The valve shall be leak proof under pressures up to 500 psi.

3.11.2.2 Tip. A tip of the size specified herein shall be incorporated in the solid-stream opening of the nozzle. The tip shall be smooth-bore type and shall be built into the nozzle to deliver a solid stream.

3.11.2.3 Attachments. Each nozzle shall be equipped with a removable, high-velocity spray head, attached to the main nozzle body by a metal chain, and a removable applicator with a low-velocity spray head, the following details shall apply:

- a. The applicator tube shall be aluminum tubing of the size and wall thickness shown in [figure 3](#).
- b. The spray-head opening of the nozzle shall be constructed to receive either a high-velocity head or an applicator by means of a bayonet joint.
- c. The applicator shall have an additional seat behind the bayonet bushing seat in accordance with [figure 3](#).
- d. Bends in the applicators shall have a 6 to 8 inch radius and shall be downward in the vertical plane of the nozzle. The length of the applicator is the length of the tube before bending.

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- e. The low-velocity spray head shall be fastened by means of external and internal threads to a bushing on the applicator.
- f. The low-velocity spray head shall be fitted with a strainer having an area 20 times the total effective free-water area through the orifices. The strainer openings shall measure not more than 3/64-inch. The strainer shall be designed to have a base that will push-fit in the head.
- g. The bushings for the bayonet joint and the head shall be pressure rolled or welded.

3.11.2.4 Sizes.

3.11.2.4.1 Size 1-inch nozzle. The tip for the 1-inch nozzle shall have a 1/4-inch opening, the following details shall apply:

- a. The high-velocity spray head shall deliver not less than 12 gpm of water fog in a consistent 90-degree conical pattern at a nozzle pressure of 100 psi, and deliver a straight stream of not less than 17 gpm at a nozzle pressure of 100 psi.
- b. The applicator shall be 4 feet long and shall be curved at an angle of 45-degrees at the spray-head end.
- c. An additional seat, 1-inch in diameter, shall be provided for that end of the applicator which fits into the nozzle body.
- d. If smaller than 1-inch outside diameter (OD) tubing is used for the applicator, the end that seats in the nozzle body shall be expanded or bushed so that it will fit properly.
- e. The applicator head shall be designed to produce an umbrella fog pattern and to discharge not less than 15 gpm of water at 100 psi.
- f. The butt end of the nozzle shall have 1-8 NH internal threads.

3.11.2.4.2 Size 1-1/2 inch nozzle. The tip for the 1-1/2 inch nozzle shall have a 1/2-inch opening, the following details shall apply:

- a.. The straight bore and high-velocity spray head shall discharge not less than 65 gpm straight stream at 100 psi, and not less than 65 gpm of water fog in a consistent 70-degree conical pattern at a nozzle pressure of 100 psi.
- b. When ejected at this pressure, the spray shall project not less than 35 feet in a circular form with an additional drift of not less than 45 feet in still air.
- c. Breakup of the spray shall be uniform at pressures from 25 to 100 psi.
- d. The applicator shall be 10 feet long and shall be curved at an angle of 90° at the spray-head end.
- e. If smaller than 1-1/4 inch OD tubing is used for the applicator, the end that seats in the nozzle body shall be expanded or bushed so that it will fit properly.
- f. The low-velocity head shall discharge not less than 54 gpm at 100 psi in an umbrella-fog-type pattern.
- g. The butt end of the nozzle shall have 1 1/2 - 9 NH internal threads.

3.11.2.4.3 Size 2-1/2 inch nozzle. The tip for the 2-1/2 inch nozzle shall have a 1-inch opening, the following details shall apply:

- a. The straight bore and high-velocity spray head shall discharge not less than 132 gpm straight stream at 100 psi, and not less than 100 gpm nor more than 150 gpm of water fog in a consistent 70-degree conical pattern at a nozzle pressure of 100 psi.
- b. When ejected at 100 psi, the spray shall be projected not less than 35 feet in a circular form with an additional drift of not less than 45 feet in still air.
- c. Breakup of the spray shall be uniform at the above pressure.
- d. The applicator shall be 10 feet long and shall be curved at an angle of 90-degrees at the spray-head end.

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- e. If smaller than 1-1/2 inch OD tubing is used for the applicator, the end that seats in the nozzle body shall be expanded or bushed so that it will fit properly.
- f. The low-velocity head shall discharge not less than 100 gpm at 100 psi in an umbrella-fog-type pattern.
- g. The butt end of the nozzle shall have 2 ½ - 7 ½ NH internal threads.

3.11.2 Class B, shutoff. The class B nozzle shall have a built-in valve conforming to 3.11.2.1, except that the valve shall provide ¼-turn shutoff and shall be fitted with a D-type or horseshoe handle. The following details shall apply:

- a. The nozzle body shall be a one-piece casting.
- b. The nozzle shall conform to the type II, class B, 1-inch nozzle, except that no applicator or low velocity spray head shall be provided, and the nozzle shall discharge not less than 25 gpm at 800 psi for fog or straight stream.
- c. The fog pattern shall be a consistent cone with an included angle of not less than 90-degrees.
- d. The spray head shall be firmly attached to the main body by a metal chain.
- e. The valve shall be easily operated and shall leak not more than 10 drops per minute at 800 psi.
- f. The symbol "HP" shall be cast integrally on the main body of the nozzle to provide quick and easy identification for high-pressure use.

3.12 Type III, solid stream.

3.12.1 Class A, plain. The class A nozzle shall be of one-piece construction as shown in figure 4 and shall be not less than 10 inches long. The waterway bore shall be smooth and unobstructed and shall taper uniformly from the butt to the tip end. The following details shall apply:

- a. The discharge end of the bore shall be machined straight to proper size with smooth walls for a depth of not less than 1-inch, and shall be counterbored at the tip to a diameter 1/8-inch larger than the tip opening for a depth of 1/16-inch.
- b. The nozzles shall withstand hydrostatic pressure up to 500 psi.
- c. Tip openings, 3/8-inch, ½-inch, and 5/8-inch, shall be threaded 1 ½ - 9 NH internal hose connection, and tip opening, 1-inch, shall be threaded 2 ½ - 7 ½ NH internal hose connection.

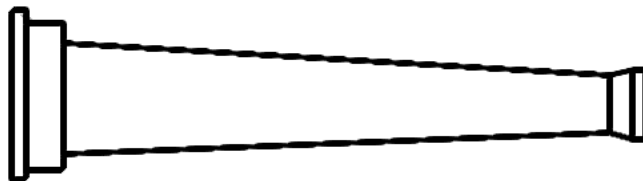


FIGURE 4. Type II, class A.

3.12.2 Class B, shutoff. The class B nozzle shall have a built-in valve conforming to 3.11.2.1, except that the valve shall provide ¼-turn shutoff and shall be fitted with a D-type or horseshoe handle. The nozzle body shall be a one-piece casting.

3.12.2.1 Size 1-inch nozzle. The nozzle shall be as shown in [figure 5](#). The diameter of the waterway shall be not less than $\frac{1}{2}$ -inch. The inlet connection for the hose shall have 1 - 8 NH internal threads, and the outlet connection for the tip shall have $\frac{3}{4}$ - 8 NH external threads.

3.12.2.2 Size 1-1/2 inch nozzle. The nozzle shall be as shown in [figure 5](#). The diameter of the waterway shall be not less than $\frac{3}{4}$ -inch. The inlet connection for the hose shall have 1 $\frac{1}{2}$ - 9 NH internal threads, and the outlet connection for the tip shall have 1 - 8 NH external threads. When specified (see [6.2](#)), the tip of the nozzle shall have 1 $\frac{1}{2}$ - 9 NH external threads.

3.12.2.3 Size 2-1/2 inch nozzle. The nozzle shall be as shown in [figure 5](#). The diameter of the waterway shall be not less than 1-1/4 inches. The butt end of the nozzle shall have a 1 $\frac{1}{2}$ - 9 NH internal thread connection. The tip end of the nozzle shall have a 1 $\frac{1}{2}$ - 9 NH external thread. When specified (see [6.2](#)), the nozzle shall be furnished with a playpipe conforming to A-A-59438.

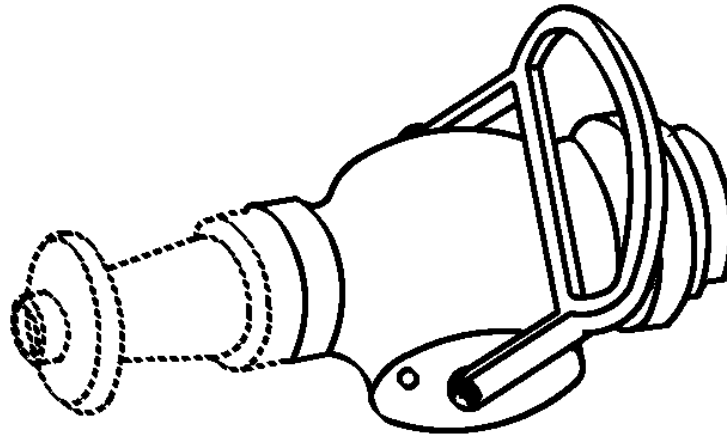


FIGURE 5. Type II, class B.

3.13 Workmanship. All parts, components, and assemblies of the nozzles which include castings and forgings shall be clean from harmful extraneous material such as sand, dirt, sprues, and scale. Surfaces shall be free from burrs, sharp edges, and corners, except when sharp edges of corners are required or where they are not detrimental to safety or function of the nozzles. The nozzles shall be examined for the defects specified in [table IV](#).

TABLE IV. Workmanship defects.

Inspection	Paragraph
Material not as specified	3.3
Materials are not corrosion and deterioration resistant or treated to be made corrosion and deterioration resistant for the applicable storage and operating environment	3.3.2 and 3.8
Dissimilar metals as defined in MIL-STD-889 are not effectively insulated from each other	3.3.2.1
Contractor does not have documentation available for identification of material, material finishes, or treatments	3.3.2.2
Rocker lugs not as specified	3.5
Threads not as specified	3.10, 3.11, and 3.12
Components missing or not as specified	3.10, 3.11, and 3.12
Finish not as specified	3.3.2, 3.8, 3.10, 3.11, and 3.12
Identification marking missing, incomplete, or illegible	3.9
Symbol "HP" missing from type II, class C nozzle	3.11.2
Weight and length not as specified for type I nozzle	3.10 (e)
Workmanship not as specified	3.13

4. VERIFICATION

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

- a. First article inspection (see 4.3 and 6.2).
- b. Conformance inspection (see 4.4).

4.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 4. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. 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 accept defective material.

4.2 Inspection conditions. Unless otherwise specified, all required inspections shall be performed in accordance with the test conditions specified in 4.5.

4.2.1 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 by the contractor.

4.3 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.

4.3.1 Samples for first article. Unless otherwise specified, after award of the contract or order, the manufacturer shall forward, from randomly selected samples one fire hose nozzle. The sample shall be representative of the construction, workmanship, components, and materials to be used during production. When a manufacturer is in continuous production of fire hose nozzles 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).

4.3.2 Inspection routine. Five samples total shall be randomly selected from the available lot or lots (see 4.3.2.1) shall be subjected to the first article inspections specified in table V. Order of the tests after design examination is manufacturer's discretion.

4.3.2.1 Lot. A lot shall consist of all fire hose nozzles of the same type, size, material, and manufactured under essentially the same conditions and submitted for acceptance at one time, see 6.2.

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

4.3.4 Disposition of samples. First article samples shall be furnished to the Government as directed by the contracting officer (see 6.2). Unless otherwise specified, after award of the contract or order, the manufacturer shall forward, from randomly selected samples, 1 nozzle. The sample shall be representative of the construction, workmanship, components, and materials to be used during production.

4.3.5 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.

If first article is waived due to prior successful first article inspection, the individual inspections and sampling and periodic inspections shall be the manufactures in house inspection procedures.

4.3.6 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.

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TABLE V. First article inspections.

Inspection	Inspection paragraph	Test paragraph	Samples
Design examination	3.5, 3.9, 3.10, 3.11, and 3.12	4.5.1	All 5
High temperature	3.6.1	4.5.2	1
Low temperature	3.6.1	4.5.3	1
Hydrostatic pressure	3.7	4.5.4	1
Discharge capacity	3.10(d), 3.11.1, 3.11.2.4.1, 3.11.2.4.2, 3.11.2.4.3 or 3.11.2	4.5.5	1
Fog pattern <u>1</u> /	3.11.1, 3.11.2.4.1, 3.11.2.4.2, 3.11.2.4.3, or 3.11.3	4.5.6	1
Bayonet joint	3.11	4.5.7	All
Ball valve leakage	3.11.1.1, 3.11.1.2, 3.11.2.1, 3.11.2.4.3(f), or 3.12.2	4.5.8	1
High-pressure ball-valve leakage	3.11.2(e)	4.5.9	1

4.4 Conformance inspection.

4.4.1 Inspection of product for delivery.

If first article is waived due to prior successful first article inspection, the individual inspections and sampling and periodic inspections shall be the manufactures in house inspection procedures.

4.4.2 Nonconformance of individual inspection tests. If one or more defects are identified, then the entire production lot shall be screened for that defect and all defects shall be removed. A second inspection sample shall then be selected from the different lot and the individual inspection tests shall be performed again. If one or more defects are identified from the second inspection lot, then the entire production lot shall be rejected and not supplied to this specification.

4.4.2.1 Production lot. A production lot shall consist of all fire nozzles of the same PIN, which have been manufactured under the same conditions and on the same continuous run.

4.5 Test methods.

4.5.1 Design examination. The nozzles shall be examined as specified in 3.5, 3.9, 3.10, 3.11, and 3.12.

4.5.2 High temperature. The nozzles shall be placed in a test chamber and the temperature of the chamber raised. The maximum ambient storage temperature shall be 145°F, and the maximum ambient operating temperature shall be 110°F with a relative humidity of not more than 15-percent. The temperature shall be maintained for not less than 4 hours. While at 110°F the moving parts of the nozzles shall be operated. Sticking, binding, or damage shall constitute failure of this test.

4.5.3 Low temperature. The nozzles shall be placed in a test chamber and the temperature of the chamber lowered. The minimum ambient storage temperature shall be minus 28°F and the minimum operating temperature shall be -25°F. The temperature shall be maintained for not less than 4 hours. While at -25°F the moving parts of the nozzles shall be operated. Sticking, binding or damage shall constitute failure of this test.

4.5.4 Hydrostatic pressure. The nozzles shall be subjected to an internal hydrostatic pressure of 500 psi except that type II, class C nozzles shall be subjected to 1000 psi. Apply pressure with the valves open and the tips plugged on adjustable and shutoff-type nozzles, so that the entire internal area of the nozzles is subjected to the pressure specified. Nonconformance to 3.7 shall constitute failure of this test.

4.5.5 Discharge capacity. The discharge capacity of the nozzle is determined by either of the following two methods:

Method 1 is by attaching a calibrated pressure gage (psi) at the effluent end of the nozzle and a calibrated flowmeter (gpm) between the influent end of the nozzle and the water feedline.

Method 2 is by attaching a calibrated pressure gage at the effluent end of the nozzle and by collecting the total discharge in a calibrated tank in a unit of time. Nonconformance to 3.10(d), 3.11.1, 3.11.2.4.1, 3.11.2.4.2, 3.11.2.4.3 or 3.11.2 shall constitute failure of this test.

4.5.6 Fog pattern. Conduct the fog pattern test on the type II nozzles only.

4.5.6.1 Procedure. Determine the fog pattern angle and effective discharge range by placing the nozzle not less than 6 feet in front of a backboard grid as shown in figure 6. Nozzle pressure shall be determined by a pressure gage placed in the water feedline immediately behind the nozzle. The pattern against the backboard shall be photographed, and the angle and range of the pattern shown on the photograph shall be determined. Failure of the fog pattern angle and range to comply with 3.11.1, 3.11.2.4.1, 3.11.2.4.2, 3.11.2.4.3, and 3.11.2 shall constitute failure of this test.

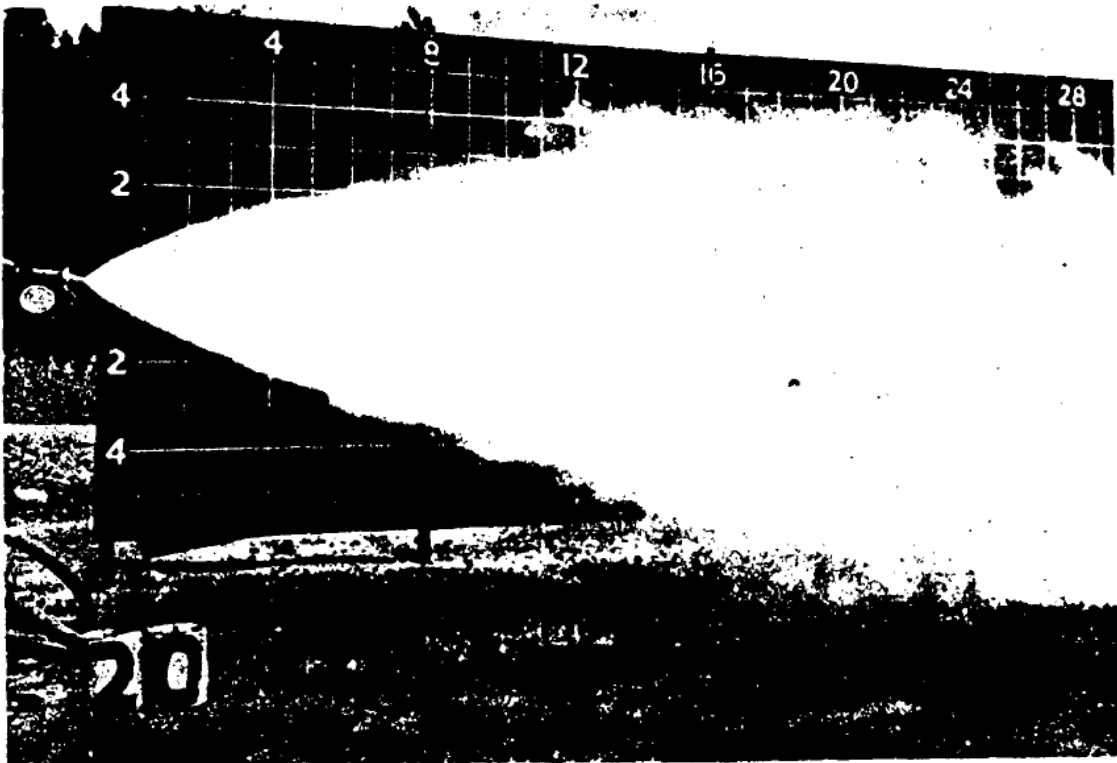


FIGURE 6. Water fog nozzle test using backboard grid.

4.5.7 Bayonet joint. To insure a positive fit between the nozzle and the applicator, insert the applicator into each nozzle and subject the nozzle and the applicator to a hydrostatic water pressure of 100 psi. Any leakage in excess of 10 cubic centimeters per hour shall constitute failure of this test.

4.5.8 Ball valve leakage. Subject the valves to a hydrostatic water pressure of 500 psi in the shut position. Any leakage in excess of 10 cubic centimeters per hour shall constitute failure of this test.

4.5.9 High-pressure-ball-valve leakage. Subject the high-pressure-nozzle shutoff valve to a hydrostatic water pressure of 800 psi. Any leakage in excess of 20 cubic centimeters per hour shall constitute failure of this test.

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

6.1 Intended use. The nozzles are intended to be attached to the end of a fire hose to direct a stream of water used in combating fires.

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Type, class and size required (see 1.2).
- c. If first article is required (see 4.4.1 and 6.3).
- d. Name and address of the first article inspection test facility to which first article samples are to be forwarded (see 4.3.4) and the name and address of the Government activity responsible for conducting the first article inspection program (see 4.3.5 and 6.3).
- e. Name and address of the Government activity responsible for receiving a production sample (see 4.3.1).
- f. Marking requirements (see 3.9).
- g. Packing requirements (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 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 NH and NST. NH/ NST are “straight” threads. The threads are consistent from tip to collar and the seal is made via the gasket inside the female coupling mating against the square face of the male coupling. The threads do not make the seal, they merely hold the two fittings tightly together.

6.4.1 Mating. The female and male side of a fire hose coupling with NH / NST threads will only connect to fittings, nozzles, or hoses with NH / NST threads. For example, a fire hose with NH / NST threaded couplings will require a nozzle or playpipe with NH / NST threads.

6.5 Information figures. Figures 1 through 5 show a type of nozzle which has been found acceptable; however, the figures are included for illustration only and are not intended for preclude the furnishing of another nozzle which conforms to this specification.

6.6 Subject term (key word) listing:

NH thread
NST thread
Playpipe

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 - ME
Navy - YD
Air Force - 84
DLA - CC

Preparing activity:
DLA - CC

(Project 4210-2018-004

Review activities:
Army - CE

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>.