

MIL-C-1203C  
31 July 1973  
~~SUPERSEDING~~  
MIL-C-1203B  
5 April 1965

## MILITARY SPECIFICATION

### COCKS, DRAIN; COCKS, PLUG; AND COCKS, SHUTOFF, SCREW STEM

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

#### 1. SCOPE

\* 1.1 Scope. This specification covers brass drain cocks and shutoff cocks in nominal sizes of 1/8-inch through 2-inch.

\* 1.2 Classification. The cocks shall be of the following types, styles, and sizes, as specified, and, when applicable, shall be in accordance with the specified military (MS) standard (see 6.2):

Type I - Drain cock, one tapped end, free discharge.

Style A - Threaded plug stem.

MS 35782 - Hollow stem, center drain, internal seat, tee handle, (MS dash numbers 1-3).

MS 35782 - Hollow stem, center drain, external seat, tee handle (MS dash numbers 4-8).

MS 35783 - Angle drain with bib, tee handle.

Style B - Ground ported plug (key), 90° turn.

MS 35784 - Spring key, straight nose, lever handle.

MS 35785 - Screw key, straight nose, lever handle (MS dash numbers 1-4).

MS 35785 - Screw key, straight nose, tee handle (MS dash numbers 5-7).

MS 35787 - Screw key, with plain faucet bib, lever handle.

Type II - Shutoff cock, ground ported plug (key), for in-line service, lever handle.

Style A - Two-way, two-port key, 90° turn, integral lever handle.

MS 35930 - Spring key.

MS 35931 - Screw key.

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Style B - Three-way, two-port key, 90° turn, integral lever handle.

MS 35932 - Screw key.

Style C - Two-way, two-port plug, 90° turn, square head with removable lever handle (no MS standard).

Style D - Two-way, two-port plug, 90° turn, fixed lever handle, stop-and-waste (no MS standard).

Type III - Shutoff cock, threaded rising stem, for in-line service, tee handle.

MS 3593 - Packed stem with packing nut.

Sizes - 1/8-inch through 2-inch (see applicable MS standard dash numbers).

## 2. APPLICABLE DOCUMENTS

\* 2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal form a part of this specification to the extent specified herein.

### SPECIFICATION

#### Military

MIL-V-3 - Valves, Fittings, and Flanges (Except for Systems Indicated Herein); Packaging of.

### STANDARDS

#### Military

MS 35782	- Cocks, Drain, Center Drain, 150 P.S.I.
MS 35783	- Cock, Drain, With Hose Bib, 150 P.S.I.
MS 35784	- Cock, Drain, Spring Key, 150 P.S.I.
MS 35785	- Cocks, Drain, Ground Key, 150 P.S.I. Steam Pressure.
MS 35787	- Cock, Drain, Ground Key, Bib Nozzle, 150 P.S.I. Steam Pressure.
MS 35930	- Cock, Plug, Spring Key, Threaded Type, 50 P.S.I.
MS 35931	- Cock, Plug, Ground Key, Threaded Type, 125 P.S.I.
MS 35932	- Cock, Plug, Three Way, Threaded Type, 125 P.S.I.
MS 35934	- Cock, Shut-Off, Screw Stem, Threaded Type, 150 P.S.I.
MIL-STD-105	- Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129	- Marking for Shipment and Storage.

(Copies of specifications and standards required by suppliers in connection with specific procurement functions should be obtained from the procuring agency or as directed by the contracting officer.)

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

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American National Standards Institute, Inc. (ANSI)

- B2.1 - Pipe Threads (Except Dryseal).
- B2.2 - Dryseal Pipe Threads.

(Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.)

American Society for Testing and Materials (ASTM)

- B16 - Free-Cutting Brass Rod, Bar, and Shapes for Use in Screw Machines.
- B30 - Copper-Base Alloys in Ingot Form.
- B36 - Brass Plate, Sheet, Strip, and Rolled Bar.
- B61 - Steam or Valve Bronze Castings.
- B62 - Composition Bronze or Ounce Metal Castings.
- B144 - High-Leaded Tin Bronze Sand Castings.
- B145 - Leaded Red Brass and Leaded Semi-Red Brass Sand Castings.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

Uniform Classification Committee, Agent

Uniform Freight Classification.

Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 S. Riverside Plaza, Chicago, IL 60606.)

National Motor Freight Traffic Association, Inc. Agent

National Motor Freight Classification.

(Application for copies should be addressed to the National Motor Freight Traffic Association, Inc. Agent, 1616 P Street, NW, Washington, DC 20036.)

Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.

3. REQUIREMENTS

\* 3.1 Description. The cocks shall consist essentially of a body, a rotating closure element, and an operating handle. Except for type II, Styles C and D, the cocks shall conform to the requirements of the applicable military sheet form (MS) standards in addition to the requirements of this specification.

\* 3.2 First article. When specified (see 6.2), the contractor shall furnish a sample cock for first article inspection and approval (see 4.2.1 and 6.3).

\* 3.3 Standard product. Cocks furnished under this specification shall be standard products of the manufacturer which meet or exceed the requirements specified herein and are identifiable by the manufacturer's established part number or equivalent designation. The cocks and component parts thereof shall be new and unused except to the extent required to perform the tests specified herein.

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\* 3.4 Interchangeability. All cocks of the same classification furnished under a specific contract shall be identical to the extent required to permit interchangeable installation and, in the case of cocks identified to MS standards, to the extent fixed by the dimensional requirements thereof.

\* 3.5 Material. Material for the cocks shall be as specified herein. When material for a part is not definitely specified, the material shall be of the type normally used by the manufacturer in cocks having the same body material and pressure rating as specified herein.

\* 3.6 Design. The cocks shall be designed for the working pressures at the coincident temperatures specified in table I. Cocks identified in 1.2 by MS standards shall conform to the designs and configurations shown therein. Any deviation from the illustrations of the MS standards shall be subject to approval by the contracting officer.

\* 3.7 Performance. The cocks shall close tightly to the extent that, when tested in accordance with 4.5.2 at the seat test pressure specified in table I, any internal leakage past the seat and, for spring key cocks (MS 35784 and 35930), any external leakage at the plug stem shall not exceed two (2) cubic centimeters per hour. For cocks with screw stems and screw keys, there shall be no external leakage past the stem or plug at the specified seat test pressure. The leakage limitations shall be attained with the plug or stem adjusted so that the maximum tangential force required to operate the cock will not exceed an amount produced by normal manual application without the use of extension levers or special tools or wrenches. The cock shall also be capable of being operated against the full working pressure applied to one side of the closed cock without the use of auxiliary levers or wrenches.

\* 3.8 Components.

\* 3.8.1 Bodies. Bodies shall be made of one of the copper alloys specified in the applicable MS standard or, in the case of type II, styles C and D, of one of the copper alloys specified in table II. If alloys in ingot form are used, the ingots shall have the same copper alloy number as is specified in the MS standard or table II, as applicable, and shall conform to the requirements for that alloy as specified in ASTM B30. Bodies may be cast, forged, or machined from bar stock at the option of the supplier. The body shall be provided with hexagonal wrenching surfaces.

\* 3.8.2 Plugs and stems. Plugs and stems shall be made of one of the materials specified in table II. The ports in plugs shall be either round, oval, or flat-way except that in no case shall the flow area through the port be less than the area of the adjacent flow passages. Spring-adjusted plugs shall be held tight against the seat by a spring made of phosphor bronze or tempered spring brass. Screw-adjusted plugs shall be secured by means of a slotted-head brass screw or a brass nut in a manner to eliminate the tendency of the screw or nut to be loosened by the operation of the plug. The fit of the screw or nut shall be sufficiently tight to prevent loosening by vibration.

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TABLE I. Rated working pressures and test pressures

MS standard or classification	Rated working pressure and coincident temperature	Test pressures (p.s.i.g.)	
		Shell	Seat
35782	150 p.s.i.g. WOG at 150° F.	150	50
35783	150 p.s.i.g. WOG at 150° F.	150	50
35784	50 p.s.i.g. WOG at 150° F.	80	10
35785	150 p.s.i.g. steam at 351° F.	300	150
35787	150 p.s.i.g. steam at 351° F.	300	150
35930	50 p.s.i.g. WOG at 150° F.	80	10
35931	125 p.s.i.g. steam at 351° F.	250	125
35932	125 p.s.i.g. WOG at 150° F.	125	125
35934	150 p.s.i.g. WOG at 150° F.	150	50
Type II, Style C	150 p.s.i.g. WOG at 150° F.	150	50
Type II, Style D	150 p.s.i.g. WOG at 150° F.	150	50

TABLE II. Material requirements for plugs and stems; also for bodies of type II, style C and D shutoff cocks

ASTM specification	Copper alloy numbers
B16	360
B36	260, 268
B61	922
B62	836
B144	935, 937, 938
B145	838, 844, 848



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\* 3.8.3 Handles. Handles for type I, style A cocks shall be made of hot or cold rolled steel and shall be cadmium-plated or zinc-plated as specified in the applicable MS standard. Handles for type II, style C cocks shall be malleable iron. Other handles shall be in accordance with the supplier's standard practice. Lever handles on two-way plug cocks shall be designed to be in-line with the port. The three-way cock (MS 35932) shall include an indexed washer to indicate by an audible click when the port is precisely aligned in any of its positions.

\* 3.8.4 End connections. Cocks identified to MS standards shall be furnished with Dryseal standard taper pipe threads (NPTF) conforming to ANSI Std. B2.2. Type II style C and style D cocks shall be furnished either with Dryseal (NPTF) or standard (NPT) taper pipe threads conforming to ANSI Std. B2.1. When specified (see 6.2), one or both end connections shall be of the compression type. The nominal sizes of threaded end connections for cocks identified to MS standards shall be in accordance with the applicable dash numbers therein. For type II, style C and style D cocks the nominal sizes of the end connections shall be from 1/2-inch through 2-inch.

\* 3.9 Finish. All surfaces of the cocks shall have the natural or machined finish normally produced by commercial manufacturing processes and techniques established as standard practice by the valve and fittings industry. Seating surfaces shall be finished as required to insure compliance with the tightness and closure force limitations of 3.7.

\* 3.10 Marking. Cocks shall be marked with the manufacturer's name or identifying symbol.

\* 3.11 Workmanship. The quality of workmanship shall be consistent with the level of quality established by the valve and fittings industry for drain and shutoff cocks produced for commercial distribution. Castings shall be free from cracks, hot tears, blowholes, porosity, or other defects affecting structural soundness. Castings which must be plugged, impregnated, brazed, or burned-in to correct defects will not be acceptable. Inside and outside surfaces of castings shall be clean. Machined parts shall be free of cracks or other defects which will interfere with proper functioning of the cock.

#### 4 QUALITY ASSURANCE PROVISIONS

\* 4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier 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.

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\* 4.1.1 Inspection of components and materials. The supplier is responsible for insuring that components and materials used were manufactured, examined, and tested in accordance with the requirements of this specification and referenced specifications and standards to the extent specified herein (see 4.5.4).

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

a. First article inspection.

b. Quality conformance inspection.

(1) In-process examination.

(2) End-item inspection.

\* 4.2.1 First article inspection. First article inspection shall be performed on one cock when a first article sample is required (see 3.2). This inspection shall include the examinations of 4.4.1 and 4.4.2, and the tests specified in 4.5.1, 4.5.2, and 4.5.3.

\* 4.2.2 Quality conformance inspection. Quality conformance inspection shall be as follows:

a. In-process inspection shall be performed on each cock to be offered for acceptance by the Government and shall include the examination specified in 4.4.1.

b. End-item inspection shall be performed on samples selected in accordance with 4.3. This inspection shall include the examinations of 4.4.1 and 4.4.2, and the tests of 4.5.1, 4.5.2, and 4.5.3.

\* 4.3 Sampling.

\* 4.3.1 Sampling for examination. A random sample of cocks shall be selected in accordance with level II of MIL-STD-105 from each lot offered the Government. The acceptable quality level (AQL) shall be 1.5 percent defective for major defects and 4.0 percent defective for minor defects. Defects shall be classified in accordance with the method of classifying defects specified in MIL-STD-105. Any item containing one or more defects shall be rejected and if the number of defective items is equal to or greater than the rejection number applicable to the specified AQL, the lot represented by the sample shall be rejected.

\* 4.3.2 Sampling for tests. A random sample of cocks shall be selected in accordance with level I of MIL-STD-105 from each lot offered the Government. Samples selected shall have passed the examination specified in 4.4.2. The AQL shall be 1.0 percent defective. Any item failing to pass a test shall be classified as defective and shall be rejected. If the number of defective items is equal to or greater than the rejection number applicable to the specified AQL, the lot represented by the sample shall be rejected.

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\* 4.3.3 Lot. A lot shall consist of all cocks of the same classification offered for delivery to the Government at one time under a specific contract. A sample item shall consist of one completely assembled cock.

\* 4.4 Examination.

\* 4.4.1 In-process examination. Cocks furnished under this specification shall be examined during production in accordance with the manufacturer's established quality control procedures which shall assure compliance with all requirements of this specification which can be checked visually and with those elements of the manufacturer's drawings or specification normally verified during the inspection process. In-process examination shall apply to all areas of contract performance including the receipt and identification of material, fabrication of the components, finishing of parts, and final assembly of the cocks. Quality control procedures shall be subject to surveillance by the procuring agency or designated representatives thereof. Failure of the manufacturer to demonstrate that adequate quality control was applied to lots submitted for acceptance by the Government may be cause for rejection of the lots.

\* 4.4.2 End-item examination. Sample cocks selected in accordance with 4.3.1 shall be examined to verify compliance with the nonoperational requirements of this specification and, when applicable, the MS standard. This examination shall verify that the items are complete and meet dimensional requirements and that all components and accessories are furnished as specified for the applicable classification of cock. The end item inspection shall also confirm that such requirements as interchangeability, material, marking, and similar provisions are complied with.

\* 4.5 Tests. Unless a commercial laboratory is used for inspection, the manufacturer shall furnish all measuring and test equipment required to conduct the examination and tests specified herein. The quality control procedures specified in 4.4.1 shall provide for regular calibration of instrumentation and test equipment in accordance with the manufacturer's established standards and procedures. Water used as the test medium for hydrostatic seat leakage tests shall be clean and free of sediment. Additives with a potential for diminishing leakage by altering such fluid properties as viscosity or surface tension shall not be used. Oil, grease, or other compounds shall not be applied to seating surfaces as a means of effecting a tighter seal. For seat tests, the cocks shall be closed by use of the levers or handles normally furnished on the cock without the use of wrenches or other auxiliary means for applying abnormal closure force.

\* 4.5.1 Shell test. Each sample cock shall be subjected to a hydrostatic or pneumatic shell test at the shell test pressure specified in table I. Drain cocks shall be tested at the inlet with the stem closed. Other cocks shall be tested with the plug or stem open and both ends closed. The duration of the test on each sample shall be 30 seconds. Any external leakage attributable to defects in castings or workmanship shall constitute failure of the test.



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\* 4.5.2 Seat test. Each sample cock passing the shell test shall be subjected to a seat test at the seat test pressure specified in table I. The test shall be either hydrostatic or pneumatic at the option of the supplier. The test pressure shall be applied to one side of the plug or stem. If no leakage is visible after the test pressure has been applied, the test may be discontinued. If measurable leakage is visible during the initial observation period, the test shall be continued for a length of time sufficient to permit an accurate determination of the leakage rate. For hydrostatic tests any leakage exceeding the maximum permissible rate specified in 3.7 shall constitute failure of the test. For pneumatic tests, leakage exceeding a rate of 25 cubic centimeters per minute of free air at standard atmospheric conditions shall constitute failure of the test. During the seat tests, the cocks shall also be observed for leakage past the plug or stem, and any leakage exceeding the specified limits shall also constitute failure of the test.

\* 4.5.3 Operating force. After the test of 4.5.1, the full working pressure shall be applied to the inlet side of plug cocks. The cock shall then be manually opened. For the test of 4.3.2, the plug or stem of the cocks shall be manually closed before the seat test begins. In either case, the need for applying levers, wrenches, or impact force to operating levers and handles to effect satisfactory operation shall constitute failure of the test.

\* 4.5.3 Material tests. Material tests shall be performed by the material supplier in accordance with the sampling procedures and test methods specified in the referenced specifications and standards. Manufacturers will not be required to perform material tests but shall be responsible for the receipt, identification, and proper application of material. The manufacturer shall maintain a general quality certification of the materials used and, when requested, shall make available to the contracting officer or his authorized representative the quality certification applicable to these materials.

4.6 Inspection of preparation for delivery. The preservation, packaging, packing, and marking of the cocks shall be examined to determine compliance with the requirements of section 5 of this specification.

## 5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging. Preservation and packaging shall be level A or C as specified (see 6.2).

5.1.1 Level A. The cocks shall be preserved and packaged in accordance with the applicable level A requirements of MIL-V-3.

\* 5.1.2 Level C. The cocks shall be packaged in a manner that will afford adequate protection against physical damage during shipment from the supply source to the first receiving activity. Standard commercial packaging may be used by the supplier provided it meets these requirements.

5.2 Packing. Packing shall be level A, B, or C as specified (see 6.2).

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5.2.1 Level A. The cocks shall be packed in accordance with the applicable level A requirements of MIL-V-3.

5.2.2 Level B. The cocks shall be packed in accordance with the applicable level B requirements of MIL-V-3.

\* 5.2.3 Level C. The cocks shall be packed in a manner which will insure arrival at destination in satisfactory condition and be acceptable to the carrier at lowest rates. Containers and packing shall comply with Uniform Freight Classification rules or National Motor Freight Classification rules.

\* 5.3 Marking. In addition to any special marking required by the contract or order, shipping containers shall be marked in accordance with the requirements of MIL-STD-129.

## 6. NOTES

\* 6.1 Intended use. The drain cocks specified herein are intended for use in the automotive field for drainage of radiators, tanks, and similar components. Shutoff cocks are used for gaging stations, fuel lines, air vents, oil lines, and similar applications.

\* 6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Type, style, and size required or, when appropriate, the applicable MS standard and dash number (see 1.2).
- c. When a first article sample is required (see 3.2).
- d. When one or both end connections shall be of the compression type (see 3.8.4).
- e. Level of preservation and packaging and level of packing required (see 3.1 and 3.2).

\* 6.3 First article. When a first article is required, it shall be tested and approved under the appropriate provisions of paragraph 7-104.55 of the Armed Services Procurement Regulation (ASPR). The first article should be a sample selected from the first production run. The first article should consist of one completely assembled cock. The contracting officer should include specific instructions in all procurement instruments regarding arrangement for examination, test, and approval of the first article.

\* 6.4 Material requirements. Records of chemical analyses and tension tests on materials furnished in accordance with ASTM specifications are systematically maintained by the material producer. However, materials for components are usually produced well in advance of orders and are furnished to industry from the supplier's current stocks. Drain and shutoff cock manufacturers maintain a general quality certification of the materials used without specific

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reference to the lot and samples representative of the particular stock being used. If the quantity and criticality of items furnished under this specification warrant production of special lots of materials which can be identified with specific tests for chemical and tensile requirements, the contract or order should state that records of these specified tests shall be made available to the procuring agency by the manufacturer.

\* 6.5 The margins of this specification are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

## Custodians:

Army - ME  
Navy - YD  
Air Force - 82

Preparing activity  
Navy - YD

(Project No. 4820-0151)

## Review activity:

Army - WC

## User activities:

Army - MI, GL, CE  
Navy - MC

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