INCH-POUND
MIL-V-18110F(SH)
19 February 1991
SUPERSEDING
MIL-V-18110E
20 March 1978
(See 6.10)

MILITARY SPECIFICATION

VALVES, GATE TYPE, STEEL
(SIZES 2-1/2 INCHES TO 16 INCHES)

This specification is approved for use by the Naval Sea Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers steel gate valves in sizes 2-1/2 inches to 16 inches for steam, water and oil services on shipboard.

1.2 Classification. Valves shall be classified in accordance with the following compositions, ratings and classes, as specified (see 6.2).

1.2.1 Composition. Valves shall be of the following compositions:

Composition A:
Chromium - 2-1/4 percent.
Molybdenum - 1 percent.
Composition B:
Chromium - 1-1/4 percent.
Molybdenum - 1/2 percent.
Composition D:
Carbon steel.
Composition E:
Corrosion resistant steel 304 or 316.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 55Z3, Department of the Navy, Washington, DC 20362-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 4820

1.2.2 Rating and class. Unless otherwise specified herein, valves shall be constructed and rated in accordance with ANSI B16.34, as follows:

Standard rating:
Class 150
Class 300
Class 400
Special rating:
Class 600
Class 900
Class 1500
Class 2500

Composition E valves shall be of standard rating, classes 150, 300, and 400.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 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 issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

HH-P-46	- Packing; Asbestos, Sheet, Compressed.
QQ-S-365	- Silver Plating, Electrodeposited: General Requirements for.
PPP-F-320	- Fiberboard; Corrugated and Solid, Sheet Stock (Container Grade), and Cut Shapes.

MILITARY

MIL-V-3	- Valves, Fittings, and Flanges (Except for Systems Indicated Herein); Packaging of.
MIL-S-901	- Shock Tests, H.I. (High-Impact) Shipboard Machinery, Equipment, and Systems, Requirements for.
MIL-F-3541	- Fittings, Lubrication, General Specification for.
MIL-A-7021	- Asbestos Rubber Compressed Sheet, for Fuel, Lubricant, Coolant, Water and Temperature Resistant Gaskets.
MS15003	- Fittings, Lubrication (Hydraulic) Surface Check, 1/8 Pipe Threads, Steel, Type III.
MIL-P-15024	- Plates, Tags and Bands for Identification of Equipment.
MIL-P-15024/5	- Plates, Identification.
MIL-R-17131	- Rods and Powders, Welding, Surfacing.
MIL-P-17303	- Packing Materials, Plastic Metallic and Plastic Nonmetallic.

MILITARY (Continued)

MIL-L-19140 - Lumber and Plywood, Fire-Retardant Treated.
MIL-G-21032 - Gaskets, Metallic-Asbestos, Spiral Wound.
MIL-A-24058 - Asbestos Packing and Gasketing Material, Impregnated.
MIL-P-24377 - Packing Material, Asbestos, Braided, Impregnated with PTFE (Polytetrafluoroethylene), Surface Lubricated.
MIL-P-24503 - Packing Material, Graphitic, Corrugated Ribbon or Textured Tape and Preformed Ring.
DOD-P-24583 - Packing Material, Graphitic, Braided Yarn. (Metric)
DOD-V-24657 - Valve Actuator, Direct Coupled, Gear Driven Electrically Powered for Shipboard Propulsion and Auxiliary Systems. (Metric)
MIL-G-24696 - Gasket, Sheet, Non-Asbestos.
MIL-G-24716 - Gaskets, Metallic-Flexible Graphite, Spiral Wound.

STANDARDS

MILITARY

MIL-STD-167-1 - Mechanical Vibrations of Shipboard Equipment (Type I - Environmental and Type II - Internally Excited).
MIL-STD-271 - Requirements for Nondestructive Testing Methods.
MIL-STD-278 - Welding and Casting Standard.
DOD-STD-2138 - Metal Sprayed Coating Systems for Corrosion Protection Aboard Naval Ships. (Metric)
MIL-STD-798 - Nondestructive Testing, Welding, Quality Control, Material Control and Identification and Hi-Shock Test Requirements for Piping System Components for Naval Shipboard Use.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

DRAWINGS

NAVAL SEA SYSTEMS COMMAND (NAVSEA)

NAVSHIPS 803-1385620 - Handwheels for Valves.
NAVSHIPS 803-1385965 - Valves, 1/2 to 1 IN, 3-Way By-Pass 900 P.S.I.
NAVSHIPS 803-2177525 - Valve Assemblies 1/2 -2 BW, SW9006B.
NAVSEA 803-5184193 - Valves, 1/4 to 2 IN. N.P.S., ANSI.

(Application for copies should be addressed to: Commander, Portsmouth Naval Shipyard, Naval Engineering Drawing Support Activity Code 202.2, Portsmouth, NH 03804-5000.)

2.2 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

B1.1 - Unified Inch Screw Threads (UN and UNR Thread Form). (DoD adopted)

B16.34 - Valves - Flanged, Threaded, and Welding End. (DoD adopted)

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

A 105 - Standard Specification for Forgings, Carbon Steel, for Piping Components.

A 106 - Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service. (DoD adopted)

A 182 - Standard Specification for Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service. (DoD adopted)

A 193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service. (DoD adopted)

A 194 - Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service. (DoD adopted)

A 216 - Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High Temperature Service. (DoD adopted)

A 217 - Standard Specification for Steel Castings, Martensitic Stainless and Alloy, for Pressure Containing Parts Suitable for High-Temperature Service. (DoD adopted)

A 240 - Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels. (DoD adopted)

A 312 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Pipes. (DoD adopted)

A 335 - Standard Specification for Seamless Ferritic Alloy-Steel Pipe for High-Temperature Service.

A 351 - Standard Specification for Steel Castings, Austenitic, for High-Temperature Service. (DoD adopted)

A 387 - Standard Specification for Pressure Vessel Plates, Alloy Steel, Chromium-Molybdenum.

A 515 - Standard Specification for Pressure Vessel Plates, Carbon Steel, for Intermediate and Higher-Temperature Service. (DoD adopted)

A 516 - Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service. (DoD adopted)

ASTM (Continued)

A 564 - Standard Specification for Hot-Rolled and Cold-Finished Age-Hardening Stainless and Heat-Resisting Steel Bars and Shapes.

B 168 - Standard Specification for Nickel-Chromium-Iron Alloys (UNS N06600 and N06690) Plate, Sheet, and Strip. (DoD adopted)

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

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

HS J1086 - Unified Numbering System (UNS) for Metals and Alloys. (DoD adopted)

(Application for copies should be addressed to the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

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 takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Qualification. Special rated valves furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable qualified products list at the time of award of contract (see 4.3 and 6.5).

3.2 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 6.6) in accordance with 4.3.

3.3 Materials. Materials shall be as specified in table I. Materials for parts other than those listed in table I shall be selected to prevent galling, seizing, or excessive wear of operating parts, and require approval of the cognizant activity or agency (see 6.3).

TABLE I. List of materials. 1/ 2/

Name of part	Material form	Composition A	Composition B	Composition D	Composition E
		Applicable documents			
Body, bonnet, and yoke	Forgings or castings	ASTM A 182, grade F 22 (UNS K21590) ASTM A 217, grade WC 9 (UNS J21890)	ASTM A 182, grade F 11 (UNS K11572) ASTM A 217 grade WC 6 (UNS J12072)	ASTM A 105 (UNS K03504) ASTM A 216 grade WC B (UNS J03002)	ASTM A 182, grade F 304 (UNS S30400) or grade F 316 (UNS S31600) ASTM A 351 grade CF3 (UNS J92500) or grade CF3M (UNS J92800)
Seat ring	Forgings castings or plate	ASTM A 182, grade F 22 (UNS K21590) ASTM A 217, grade WC 9 (UNS J21890) ASTM A 387 grade 22 class 2 (UNS K21590)	ASTM A 182, grade F 11 (UNS K11572) ASTM A 217 grade WC 6 (UNS J12072) ASTM A 387 grade 11 class 2 (UNS K11789)	ASTM A 105 (UNS K03504) ASTM A 216 grade WC B (UNS J03002) ASTM A 515 grade 70 (UNS K03101) ASTM A 516 grade 70 (UNS K02700)	ASTM A 182, grade F 304L (UNS S30403) or grade F 316L (UNS S31600) ASTM A 351 grade CF3 (UNS J92500) or grade CF3M (UNS J92800) ASTM A 240, grade 304 (UNS S30400) or ASTM A 240, grade 316 (UNS S31600)
Retaining ring	Forgings castings or plate	ASTM A 182, grade F 22 (UNS K21590) or grade F 11 (UNS K11572) ASTM A 105 (UNS K03504) ASTM A 217, grade WC 9 (UNS J21890) or grade WC 6 (UNS J12072)			ASTM A 182, grade F 304L (UNS S30403) or grade F 316L (UNS S31600)

See footnotes at end of table.

TABLE I. List of materials 1/ 2/ - Continued.

Name of part	Material form	Composition A	Composition B	Composition D	Composition E
		Applicable documents			
		ASTM A 216, grade WC B (UNS J03002) ASTM A 182, grade F 304 (UNS S30400) or grade F 316 (UNS S31600) ASTM A 515 grade 70 (UNS K03101) ASTM A 387 grades 11 class 2 (UNS K11789) or grade 22, class 22 (UNS K21590)			ASTM A 351 grade CF3 (UNS J92500) or grade CF3M (UNS J92800) ASTM A 240, grade 304 (UNS S30400) or ASTM A 240, grade 316 (UNS S31600)
Stem	Barstock alloy steel	Cr-13 (see table VII)	Cr-13 (see table VII)	Cr-13 (see table VII)	ASTM A 564 (UNS S17400) type 630
Bonnet fasteners bolts and studs	Barstock alloy steel	ASTM A 193, grade B 16 (UNS K14072)		ASTM A 193, grade B 7 (UNS H41400) or grade B 16 (UNS K14072)	ASTM A 193, grade B 7 (UNS K14072)
Bonnet nuts		ASTM A 194, grade 4 or 7 (UNS K14510)		ASTM A 194, grade 2 H (UNS K04002) or grade 4 (UNS K14510)	ASTM A 194, grade B 7 (UNS K14072)

See footnotes at end of table.

TABLE I. List of materials 1/ 2/ - Continued.

Name of part	Material form	Composition A	Composition B	Composition D	Composition E
		Applicable documents			
Standard pressure seal rings and standard oversized pressure seal rings	Low carbon steel, silver plated	Commercial			
Gaskets (for flanged bonnets)	Spiral wound	MIL-G-24716, type I			
	Compressed sheet	MIL-G-24696			
Packing	Graphitic	MIL-P-24503, DOD-P-24583			
Nuts bolts washers, bushings, liners	Materials used in construction of these parts other than specified above shall be in accordance with the material specifications shown on the contractor's drawings (see 6.3 and appendix A).				
Valve trim	(see table VII)				

1/ Table I contains the commercial and military specifications and standards, and in addition, contains the corresponding SAE HS J1086 Unified Numbering System (UNS) designation. Reference to a specific UNS designation will permit the use of any one of the many alloy specifications and standards listed in SAE HS J1086 for that UNS number.

2/ Bonnets, yoke and seat ring for composition D valves may be in accordance with ASTM A 217, grade WC 6 or ASTM A 182, grade F11.

3.3.1 Recovered materials. Unless otherwise specified herein, all equipment, material, and articles incorporated in the products covered by this specification shall be new and may be fabricated using materials produced from recovered materials to the maximum extent practicable without jeopardizing the intended use. 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 opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification unless otherwise specifically specified.

3.4 Construction. Unless otherwise specified herein, valves, valve parts and construction features and parameters shall conform to ANSI B16.34 (see 6.3 and appendix B).

3.4.1 Pressure temperature ratings. The design and pressure temperature rating shall be in accordance with ANSI B16.34, except the maximum allowable temperature for composition D shall be 775 degrees Fahrenheit (°F). Pressure seal valve shall be constructed in such a manner as to permit repair by the use of oversize rings.

3.4.2 End connections. End connections shall be in accordance with ANSI B16.34, flanged, socket welded or butt welded for the standard valves and butt welded only for the special valves. Butt welding ends shall be compatible with the appropriate pipe schedule end preparation (see 6.2).

3.4.3 Flanges. Flanged end valves shall have flanges that are compatible with the corresponding mating flange for face preparation, number and size of bolts holes and pressure rating (see 6.2).

3.4.4 Drains and by-passes. When specified (see 6.2), a drain or by-pass shall be furnished and located as specified in 3.4.4.1 through 3.4.4.5 and ANSI B16.34. A drain shall consist of a nipple and drain valve. A by-pass shall consist of connecting lines and a by-pass valve.

3.4.4.1 Size. Standard drain and by-pass sizes shall be as shown in table II. Nonstandard sizes shall be as specified (see 6.2).

TABLE II. Standard drain and by-pass sizes.

Valve size (inches)	Size of by-pass and (inch)	Size of bonnet drain (inch)
2-1/2	1/2	1/4
3	1/2	1/4
4	1/2	1/4
5	3/4	1/4
6	3/4	1/4
8	3/4	1/4
10	1	1/4
12	1	1/4
14	1	1/4
16	1	1/4

3.4.4.2 Location. The location of drains and by-passes shall be specified by referencing the letter designation in ANSI B16.34 of the desired bosses. Bosses shall be sufficient distance away from seating area to allow welding of replacement by-pass line without damage to valve seat. When nonstandard locations are required, a drawing shall be furnished by the user indicating the desired location. Threaded boss connections shall not be used.

3.4.4.3 Root connections. Drain and by-pass line connections shall be welded to the boss in the valve body in accordance with MIL-STD-278. Materials for these lines shall be as follows:

(a) Composition A - ASTM A 335, grade P22.
(b) Composition B - ASTM A 335, grade P11.
(c) Composition C - ASTM A 106, grade B.
(d) Composition E - ASTM A 312, grade 304 (UNS 30400) or grade 316 (UNS 31600).

3.4.4.4 Bosses. Bosses shall be cast or forged integral with the body as specified (see 6.2). Construction and dimensions of bosses shall be in accordance with ANSI B16.34, undrilled. Forged valve bodies with wall thickness in accordance with ANSI B16.34 may have bosses built up with weld filler material selected in accordance with MIL-STD-278. Such bosses shall be liquid penetrant inspected and stress relieved in accordance with MIL-STD-278.

3.4.4.5 Valves. Drain and by-pass valves shall be in accordance with Drawing 803-5184193, 803-2177525, or 803-1385965.

3.4.5 Water way diameters. Water way diameters of valves shall be in accordance with table III. Documents of water ways in classes and sizes not listed in table III are not required.

TABLE III. Waterway minimum diameters.

Valve sizes (inches)	Class 600	Class 900	Class 1500	Class 2500
2-1/2	2-1/8	1-15/16	1-15/16	1-1/2
3	2-5/8	2-5/8	2-3/8	1-3/4
4	3-7/16	3-7/16	3-1/8	2-1/2
5	4-3/8	4-5/16	4-5/16	3
6	6	5	4-3/4	3-3/4
8	7-7/8	6-9/16	6-1/4	5
10	9-3/4	8-1/4	7-3/4	6
12	10-1/4	10-1/4	9-1/4	7-1/4
14	11-1/4	11-1/4	10-1/2	8
16	12-7/8	12-7/8	11-3/4	9

3.4.6 Weights and center of gravity. After completion of the first valve, a weight shall be shown on the drawing. The manufacturer shall submit center of gravity information for valves weighing in excess of 100 pounds. The estimated

center of gravity shall be as shown on the drawings (see 6.2). Handwheel actuated, welded end type valves shall not exceed the maximum weights listed in tables IV and V. Weights are based on valves with welded ends and do not include weights of drains, by-passes, actuators, and so forth. Weights of valves in classes and sizes not listed in table IV and V are not required. The valve weights in table IV are for class 600, 900, 1500 and 2500 cast gate valves, welded ends. The valve weights in table V are for the same valve design in the forged configuration.

TABLE IV. Maximum weights for cast body valves.

Valve sizes (inches)	Class 600 (pounds)	Class 900 (pounds)	Class 1500 (pounds)	Class 2500 (pounds)
2-1/2	45	80	80	100
3	70	105	120	170
4	110	165	225	335
5	180	260	350	610
6	285	425	560	840
8	615	810	1025	1440
10	915	1130	1880	2490
12	1405	1750	2650	3850
14	1900	2360	3050	4410
16	2575	2900	4200	6500

TABLE V. Maximum weights for forged body valves.

Valve sizes (inches)	Class 600 (pounds)	Class 900 (pounds)	Class 1500 (pounds)	Class 2500 (pounds)
2-1/2	58	104	104	130
3	91	136	156	221
4	143	214	292	435
5	234	338	455	793
6	370	552	728	1092
8	799	1053	1332	1872
10	1189	1469	2444	3237
12	1826	2275	3445	5005
14	2470	3068	3965	5733
16	5362	3770	5460	8450

3.4.7 Flow coefficient. The flow coefficient (CV) for the 600 to 2500 rated valves shall be as specified in table VI. The flow rates are based on values for valves in the fully open position.

TABLE VI. Minimum CV.

Size	Class 600	Class 900	Class 1500	Class 2500
2-1/2	355	295	295	141
3	542	542	444	189
4	958	958	791	409
5	1599	1554	1544	558
6	3107	2157	1947	915
8	5540	3847	3489	1672
10	8493	6080	5366	2301
12	9740	9740	7933	3406
14	11734	11734	10221	4593
16	15369	15369	12800	5074

3.4.8 Shock resistance. Valves and valves with attached gear or power actuators shall withstand high impact shock in accordance with grade A, hull-bulkhead mounted principal unit, complete assembly, class I, type C of MIL-S-901.

3.4.9 Vibration. Valves shall withstand the vibration requirements of MIL-STD-167-1. Unless otherwise specified herein, valves with gear or power actuators shall withstand the vibration requirements of MIL-STD-167-1.

3.4.10 Bonnet and yoke.

3.4.10.1 Flanged, pressure seal and seal welded membrane pressure boundary bonnets. Valve classes 150, 300 and 400 shall have flanged bonnets. Valve classes 600, 900, 1500 and 2500 shall have pressure seal or seal welded membrane pressure boundary bonnets.

3.4.10.2 Flanged bonnets. Flanged bonnets shall be of the male and female or small tongue and groove type and spiral wound gaskets in accordance with MIL-G-21032.

3.4.10.3 Pressure seal bonnets. Seal rings for pressure seal bonnets shall provide a seal either by plastic or elastic expansion. The bonnet seal ring region of the valve body shall be inlaid with material in accordance with ASTM B 168.

3.4.10.3.1 Plastic expansion seal rings. Seal rings sealing by plastic expansion shall have a Brinell hardness number (Bhn) of 110 maximum and be silver plated in accordance with QQ-S-365, grade A.

3.4.10.3.2 Elastic expansion seal rings. Seal rings sealing by elastic expansion shall have a Bhn of 140 maximum and be silver plated.

3.4.10.4 Seal welded body to bonnet pressure boundary designs. Valves that employ seal welded pressure boundary construction between the body and bonnet shall be constructed so that the seal weld is isolated from the structure and

mechanical loading and that the seal weld is only subjected to temperature and pressure transients. Valves employing a seal welded external boundary shall reference a NAVSEA approved welding procedure on the nameplate.

3.4.11 Yoke. Valves shall be of the outside screw and yoke construction.

3.4.12 Stuffing boxes and glands.

3.4.12.1 Stuffing boxes. Stuffing boxes shall be of a depth sufficient to accommodate packing that will assure a pressure tight seal at the rated pressure and temperature of the valve and to assure a positive engagement between the stuffing box and gland.

3.4.12.2 Glands. Stuffing box glands shall be secured and adjusted by a threaded arrangement which by adjustment will vary the compression of the stem packing to seal the stem penetration under all operating conditions. Bearing surface between the gland follower and the gland flange shall be spherically finished.

3.4.13 Valve trim.

3.4.13.1 Stem. Valve stems shall have modified Acme type threads for valve operation and Unified National Standard threads for handwheel attachment in accordance with ANSI B1.1. Unless otherwise specified (see 6.2) the valve shall have a rising stem construction.

3.4.13.2 Disc/stem. Discs shall be of a double face construction. Discs in valves with ratings up to and including class 400 shall be of either the solid or flexible construction. Discs in valves 600 to 2500 class shall be of the flexible construction. Valve construction shall include disc guide slots and the valve body shall have disc guides for the full length of the disc travel.

3.4.14 Main seat. Seat rings for classes 150 to 400 may be rolled in, threaded or welded in place. Seat rings for classes 600 to 1500 and for use in steam systems for all classes shall be seal welded, if threaded or welded in place. When seat rings are threaded in valves intended for steam service, the seat ring shall be seal welded circumferentially so as to prevent leakage past the seat rings.

3.4.14.1 Back seat. Valves shall have a positive back seat between the stem and bonnet only. Valve class 600 and higher shall have hard facing (HF) back seat and shall be the same as the main seat material in table VII (see 3.4.14.3).

3.4.14.2 Valve trim material. Unless otherwise specified (see 6.2), valve trim material shall be in accordance with tables I and VII.

TABLE VII. Valve trim materials.

Service	Valve trim symbols 1/		Temperature limitations (°F)
	Disc 2/	Seat 2/	
Steam 3/	HF 3/	HF	1050
Water 4/	Ni-Cu HF	Cr 13 HF	750 1050
Oil	Ni-Cu Cr 13 HF	Cr 13 Cr 13 HF	500 1000 1050

1/ HF may be substituted for other seats and discs under all temperature and service conditions.
2/ Where unlike seats and discs are used, either the seat or the disc may be Cr 13 or Ni-Cu at the manufacturer's option.
3/ Steam valves shall have HF seats and discs.
4/ Water valves class 600 and higher shall have HF seats and discs.

3.4.14.3 Hard facing. Welding materials shall be in accordance with type MIL-RCoCr-A-1, -2, and -3 of MIL-R-17131. The minimum Rockwell C 38 finished thickness of HF seating surfaces shall be 3/32 inch.

3.4.15 Valve handwheels.

3.4.15.1 Rotation. Valves shall close by clockwise rotation of the handwheel when facing the handwheel.

3.4.15.2 Material and construction. Handwheels 11 inches in diameter and smaller shall be of commercial design and manufactured from steel, ductile iron, malleable iron, or aluminum. Handwheels 12 inches in diameter and larger shall be aluminum alloy or cast steel in accordance with the general dimensions of Drawing 803-1385620. Steam handwheel connection shall be in accordance with Drawing 803-1385620.

3.4.15.3 Size. Handwheels shall be sized so that a tangential force of not more than the value specified in table VIII is required to be exerted on the rim of the handwheel to effect tight closure (see 4.7.6.2). Valve operating devices may be necessary to accomplish effective closure.

TABLE VIII. Maximum allowable tangential force to seat valve based on valve handwheel size.

Handwheel diameter	Tangential force
(Inches)	(Pounds)
2	90
3	98
4	106
5	112
6	118
7	121
8	124
9	127
10	130
11	133
12	135
14	138
16	141
18	144
21	147
24	150
27	150
30	150
36	150

3.4.16 Gear actuators. When specified (see 6.2), commercial design manual gear actuators shall be provided. The actuators shall be ductile iron, nodular iron or steel.

3.4.16.1 Power actuators. When specified (see 6.2) power actuators shall be provided. Valves shall be constructed to assure means of mounting power actuators on the valves. When valves are provided with electric actuators, the requirements of DOD-V-24657 shall be accomplished.

3.4.17 Seat leakage. Unless otherwise specified (see 6.2), allowable seat leakage is considered to be leakage of water not in excess of 10 cubic centimeters (cm^3) per hour per inch of nominal pipe size (nps) (see 4.7.6.2).

3.4.18 Lubrication. Yoke bushings shall be equipped with a 1/8-inch threaded or push design, type III lubricating fitting in accordance with MIL-F-3541 and MS15003.

3.4.19 Welding and fabrication.

3.4.19.1 Welding. Welding shall be in accordance with MIL-STD-278.

3.4.19.2 Fabrication. Fabricated assemblies shall be stress relieved as units prior to finish machining. Stress relieving shall be done in accordance with MIL-STD-278.

3.4.20 Assembly and disassembly. Valve construction shall assure that assembly and disassembly of the valve can be accomplished on board ship by Navy shipboard personnel without the need for special training or special tools. Special tools are defined as those tools not listed in the Federal Supply Catalog (copies of this catalog may be consulted in the office of the Defense Contract Administration Services Management Area (DCASMA)). Configuration shall be such as to permit the use of a portable boring machine to repair the bonnet inlay of the valve with the valve in place in the piping system.

3.4.21 Interchangeability. In no case shall parts be physically interchangeable or reversible unless such parts are also interchangeable or reversible with regard to function, performance and strength.

3.4.22 Corrosion protection. When specified (see 6.2) valve bodies shall be metal sprayed for corrosion protection in accordance with DOD-STD-2138.

3.5 Body markings and identification plates.

3.5.1 Body markings. Valve bodies shall have the composition, class and the manufacturer's name or trademark cast or forged integral with the valve body. When neccessary, metal stamping will be permitted on the neck of the valve body or other similar surfaces not subjected to high stresses in service.

3.5.2 Identification plates. Identification plates in accordance with MIL-P-15024 and MIL-P-15024/5 made of corrosion-resisting steel or brass, shall be permanently fastened to a part of the valve not subjected to working pressure, preferably the yoke. Identification plates shall include the following data or a space for:

(a) Manufacturer's name or trademark.
(b) Size of valve and class.
(c) Body and bonnet material composition.
(d) Valve trim identification (stem-disc-seat).
(e) Manufacturer's identification number (optional).
(f) Manufacturer's drawing number.
(g) MIL-V-18110.
(h) Component identification number (CID), if known.
(i) National stock number (NSN), if known.
(j) Membrane seal welding and repair procedure.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase 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 this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program (see 6.3). 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 the 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 Classification of inspections. The inspection requirements specified herein are classified as follows:

(a) Qualification inspection (see 4.3).
(b) First article inspection (see 4.3).
(c) Quality conformance inspection (see 4.4).

4.3 Qualification and first article inspections. Inspections of the special and standard valves shall be conducted at a laboratory satisfactory to NAVSEA. Qualification and first article inspections (see 6.3) shall consist of the examinations and tests in 4.6 and 4.7.

4.3.1 Inspection samples. Special and standard valves submitted for qualification and first article inspections shall be of the size, class and composition specified in table IX. Valve sizes which have passed the qualification and first article examinations and tests will qualify or certify other valve sizes of identical class and composition as listed in table IX provided variations in construction throughout the various sizes and classes are demonstrated by analyses to be satisfactory to NAVSEA.

TABLE IX. Valve test sizes, classes and composition. 1/

Sizes to be tested (inches)	Class and composition	Certifies these valve sizes, classes and compositions		
		Comp.	Classes	Sizes (inches)
4	1500, comp. B	A, B, and D	600, 900, 1500 and 2500	2-1/2 to 4 inclusive
	400, comp. D	D	150, 300, and 400	
	400, comp. E	E		
8	1500, comp. B	A, B and D	600, 900, 1500 and 2500	5 to 8 inclusive

TABLE IX. Valve test sizes, classes and composition 1/ - Continued.

Sizes to be tested (inches)	Class and composition	Certifies these valve sizes, classes and compositions		
		Comp.	Classes	Sizes (inches)
	400, comp. D	D	150, 300 and 400	
	400, comp. E	E		
10	1500, comp. B	A, B and D	600, 900, 1500 and 2500	9 and 10 inclusive
	400, comp. D	D	150, 300 and 400	
	400, comp. E	E		
All sizes above 10	1500, comp. B	A, B and D	600, 900, 1500 and 2500	12, 14 and 16
	400, comp. D	D	150, 300 and 400	
	400, comp. E	E		

1/ Testing of lower pressure classes will certify only that lower pressure class valves.

4.3.2 Qualification inspection and test report. The contractor shall prepare a qualification inspection and test report. The following information shall be included:

(a) Valve, size, composition and class.
(b) MIL-V-18110.
(c) Manufacturer's name.
(d) Date of qualification.
(e) Component identification number (if known).

4.3.3 Extension of qualification. Qualification may be extended where the Government has sufficient verifiable evidence based on previous test data or shipboard service experience, or both, with the same or similar application to satisfactorily demonstrate that the items proposed meet all requirements and are suitable for the intended application. Extension request shall be approved by the contracting activity.

4.4 Quality conformance inspection. Each special and standard class sample valve shall be examined as specified in 4.6. Each special class valve shall be inspected and tested in accordance with 4.7.1 and 4.7.6. Each standard class valve shall be tested in accordance with 4.7.1.4 and 4.7.6.

4.5 Sampling for visual and dimensional examination.

4.5.1 Lot. A lot shall consist of all valves of the same size, class, and composition offered for delivery at the same time.

4.5.2 Sample. Sample valves shall be selected at random from each lot in accordance with table X for the visual and dimensional examination specified (see 4.6).

TABLE X. Sampling for visual and dimensional examination.

Lot size	Sample size
2 to 8	2
9 to 15	8
16 to 25	10
26 to 65	16
66 to 180	26

4.6 Examinations.

4.6.1 Examination of materials. Materials used in the manufacture of valves shall be examined to determine conformance to 3.3 and table I, as applicable. Contracting activities or their representatives will normally accept certifications that the material complies with the specification (see 3.3); however, testing to prove compliance may be required.

4.6.2 Visual and dimensional examination. Each special and standard sample valve (see 4.5) shall be examined to determine compliance with all requirements of this specification not involving tests. Any sample valve that fails to meet these requirements shall be rejected. Rejected lots may be resubmitted for examination after the contractor has inspected an additional sample (sample size, class and composition) of the remaining uninspected valves. Acceptance number for this second sampling shall be the same as the first. Failure of this second examination shall require the contractor to examine all remaining uninspected valves at the same acceptance number. Failure of this examination will form the basis for cancelling the purchase.

4.7 Test methods.

4.7.1 Nondestructive testing. Nondestructive testing shall consist of the following radiographic, magnetic particle, and liquid penetrant inspections.

4.7.1.1 Radiographic. Pressure containing castings of valves for class 600 and above shall be radiographically inspected in accordance with the following:

(a) Radiographic inspection shall conform to MIL-STD-271.
(b) Radiographic acceptance shall conform to MIL-STD-278.
(c) Radiographic coverage shall be 100 percent of total area.

4.7.1.2 Magnetic particle. Pressure containing forgings of valves in class 600 and above shall be magnetic particle inspected in accordance with MIL-STD-271. Forgings shall be free from flaws such as seams, cracks, laps, porosity, scale, flakes, and all other defects detrimentally affecting the suitability of the forging for the service intended.

4.7.1.3 Defects to be repaired. The following shall apply to those parts inspected in accordance with 4.7.1.1 and 4.7.1.2:

(a) Defects less than 0.030 inch in depth need not be repaired provided the bottom of the defect is rounded and visible, and the minimum wall thickness is maintained.
(b) Defects greater than 0.030 inch in depth but less than 15 percent of the wall thickness shall be repaired by removing the defective material. This material shall be removed by drilling or grinding to a bottom radius of at least three times the depth of the defect. The depth of the finished repair shall be less than 15 percent of the undamaged wall thickness. Sharp corners shall be faired into the base metal. Welding is not required to effect a repair of this nature, provided the minimum wall thickness is maintained.
(c) Defects greater than 15 percent of the wall thickness shall be repaired by removing the defective material and welding. The material shall be removed by grinding or drilling and then welded in accordance with 3.4.19. The crown of the weld shall be blended into the base metal.

4.7.1.4 Hard faced seating. Hard faced seating surfaces shall be liquid penetrant inspected in accordance with MIL-STD-271 after rough machining and shall be free of cracks or crack-like defects.

4.7.2 Cold tests. Cold tests shall be performed as follows:

(a) Operation - 2000 cycles.
(b) Hydrostatic - shell and closure tests (see 4.7.6).

4.7.2.1 Cold operational testing. Valves shall be cycled a minimum of 2000 times in a cold loop, pressurized to not less than 100 percent of rated pressure at 100°F in accordance with ANSI B16.34 and 1.2.2. There shall be a flow of water through the valve when it is open during the test, the quantity being dependent upon the test facility. During the test of the valves, there shall be a differential pressure of not less than 100 percent of rated pressure at 100°F in accordance with ANSI B16.34 and 1.2.2 existing across the valve at the beginning of each opening. The torque required to open the valve shall be recorded at the start after 1000 cycles and 2000 cycles. Seat leakage test shall be performed in accordance with 4.7.6.2 at the start, after 1000 cycles, and 2000 cycles. Leakage rate shall be in accordance with 3.4.17.

4.7.3 Hot tests. Hot tests shall be conducted with steam temperature and pressure in accordance with table XI and shall be performed in the following sequence:

(a) Thermal shock.
(b) Operation - 200 cycles.

4.7.3.1 Thermal shock tests. Valves shall be thermal shocked 10 times by reducing the steam temperature in table XI by a minimum of 35 percent in not more than 30 seconds. Steam temperatures shall be recorded at a point as close to the valve as possible, preferably with the temperature sensing inside the valve. In addition to the steam temperature, a thermal couple shall be attached to the exterior of the valve in a zone of maximum temperature and minimum wall thickness. A record shall be kept during each thermal shock cycle to indicate the temperature of the valve at the start of the cycle, the minimum temperature obtained during the cycle and the time required to reduce the valve to the minimum temperature, as well as the time required to restore the valve to the maximum temperature.

4.7.3.2 Operational tests. Steam temperature and pressure shall be passed through the valve for a period of not less than 48 hours. During this period, at approximately one third intervals, the valve shall be closed and cooled to ambient temperature a total of three times. After cooling, the valve shall be opened and the torque required to open the valve shall be determined. Subsequently, the steam flow shall be resumed and the valve shall be cycled from open to closed a minimum of 200 times and the operating torques shall be determined each 100 cycles.

TABLE XI. Steam temperature and pressure for hot test of valve.

Class	Pressure (lb/in^2) ± 10%	Temperature (°F) + 10%, -0%	Applicable valve composition
150	150	550	A, B, D, E
300	300	600	A, B, D, E
400	400	650	A, B, D, E
600	600	750	A, B, D
900	900	850	A, B, D
1500	1200	950	A, B
2500	1200	950	A, B

4.7.4 Shock test. Valves shall be subjected to the grade A shock test in accordance with MIL-S-901 and MIL-STD-798 to determine conformance to the requirement specified in 3.4.8. Valves shall be hydrostatically pressurized to 100 percent of the 100°F rating as specified in 1.2.2. Testing medium shall be clean tap water with no additive other than traces of cutting oil at a temperature not less than 40°F or greater than 150°F. Momentary malfunction at the time of impact blow is permitted. Permanent deformation, misalignment or functional impairments shall be cause for rejection. Cycle the valve 10 times with the allowable torque of table VIII and seat leakage test in accordance with 4.7.6.2 immediately after the completion of the shock tests. Seat leakage shall not exceed the amount specified in 4.7.6.2.

4.7.5 Vibration test. Valves shall be subjected to the vibration test in accordance with MIL-STD-167-1 and MIL-STD-798 to determine conformance to the requirements specified in 3.4.9.

4.7.6 Hydrostatic tests. Valves shall be subjected to the tests specified in 4.7.6.1 for strength and porosity, and the tests specified in 4.7.6.2 for tightness. Water temperature shall not exceed 100°F.

4.7.6.1 Shell test. Valves shall be given a shell test at a gauge pressure not less than 1-1/2 times the 100°F rating, rounded off to the next higher pound per square inch (25 lb/in^2) increment. The test shall be made with water, which may contain a corrosion inhibitor, or with kerosene, or with other suitable fluid, provided such fluid has viscosity not greater than that of water, at a temperature not above 125°F. Visually detectable leakage through pressure boundary walls is not acceptable. Test duration shall be not less than as follows:

Valve size nps (inches)	Test time (seconds)
2-1/2 to 8	60
10 and larger	180

Test shall be made with the valve in the partially open position. Leakage through the stem packing shall not be cause for rejection.

4.7.6.2 Closure tests. Following the shell test, valves shall be given a closure test. Each valve shall be given a closure test using fluid described in 4.7.6.1 at a pressure not less than 110 percent of the 100°F pressure rating. The valve shall be main seated using a seating torque in accordance with hand wheel forces in table VIII. The test pressure shall be applied alternately to each side of the valve disc. Leakage rate of fluid test shall not exceed 10 cm^3, per hour per inch of nominal pipe size. Duration of closure test shall be the same as specified in 4.7.6.1.

4.7.6.3 Special conditions. Valves designed for operating conditions that have the pressure differential across the closure member limited to values less than the 100 percent pressure rating and having closure members or actuating devices (direct, mechanical, fluid, or electrical) that would be subject to damage at high differential pressures, shall be tested as described above, except that the closure test may be reduced to 110 percent of the maximum specified closed position differential pressure. This exception may be exercised upon the agreement between the Navy and contractor. The contractor's nameplate data shall include reference to any such limitation.

4.8 Examination after qualification and first article tests. Valve shall be disassembled and visually and dimensionally examined for damage and wear. Disassembly and reassembly shall be performed to determine the practicability of maintaining a valve of this design for shipboard use (see 3.4.20). The maintainability demonstration shall be conducted by removing and replacing the pressure seal ring, or seal welded flexible seal ring, disc and stem. This shall be accomplished by following the instructions in the technical manuals. Particular emphasis shall be directed towards the possibility of loss of small parts by the maintenance crew.

4.9 Inspection of packaging. Sample packages and packs, and the inspection of the preservation, packing and marking for shipment and storage, shall be in accordance with the requirements of section 5 and the documents specified therein.

5. PACKAGING

(The packaging requirements specified herein apply only for direct Government acquisition. For the extent of applicability of the packaging or preparation for delivery requirements of referenced documents listed in section 2, see 6.8.)

5.1 Packaging requirements. Valves shall be preserved level A, C, or commercial, packed level A, B, C or commercial as specified (see 6.2) and marked in accordance with MIL-V-3 and shall include bar codes and applicable packaging acquisition options therein as specified (see 6.2). In addition, for Navy acquisitions, the following applies:

(a) Navy fire-retardant requirements.

(1) Lumber and plywood. Unless otherwise specified (see 6.2), all lumber and plywood including laminated veneer material used in shipping container construction members, blocking, bracing, and reinforcing shall be fire-retardant treated material conforming to MIL-L-19140 as follows:

Levels A and B - Type II - weather resistant.
Category 1 - general use.
Level C - Type I - non-weather resistant.
Category 1 - general use.

(2) Fiberboard. Unless otherwise specified (see 6.2), fiberboard used in the construction of class-domestic, non-weather resistant fiberboard and cleated fiberboard boxes including interior packaging shall meet the flamespread and the specific optic density requirements of PPP-F-320.

6. NOTES

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

6.1 Intended use. Gate valves are intended for use in steam, water, and oil service.

6.2 Acquisition requirements. Acquisition documents must specify the following:

(a) Title, number and date of this specification.
(b) Size and classification required (see 1.2).
(c) Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
(d) Service conditions.
(e) Quantity required.
(f) First article inspection (see 3.2).
(g) End connection preparation (see 3.4.2).
(h) End flanges (see 3.4.3).

(i) Location of drains and by-passes (see 3.4.4).
(j) Nonstandard sizes of drains and by-passes (see 3.4.4.1).
(k) Boss requirements (see 3.4.4.4).
(l) Center of gravity location (see 3.4.6).
(m) Vibration requirements (see 3.4.9).
(n) Valve trim material (see 3.4.14.2).
(o) Commercial design gear actuators (see 3.4.16).
(p) Power actuators (see 3.4.16.1).
(q) Allowable seat leakage (see 3.4.17).
(r) Corrosion protection required (see 3.4.22).
(s) Stem requirement (see 3.4.13.1).
(t) Levels of preservation and packing required (see 5.1).
(u) When fire-retardant material is not required (see 5.1).
(v) Special marking required (see 5.1).

6.3 Consideration of data requirements. The following data requirements should be considered when this specification is applied on a contract. The applicable Data Item Descriptions (DID's) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DID's are tailored to reflect the requirements of the specific acquisition. To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DoD FAR Supplement 27.475.1 exempts the requirement for a DD Form 1423.

Reference Paragraph	DID Number	DID Title	Suggested Tailoring
3.3	DI-E-2121	Certificate of compliance	----
Table I and appendix A	DI-DRPR-80651	Engineering drawings	Level 3
3.4 and appendix B	DI-MISC-80678	Certification/data report	----
4.1.1	DI-R-4803	Inspection system program plan	----
4.3	DI-T-4901	First article inspection procedure	----
4.3	DI-T-4902	First article inspection report	----
4.4	DI-T-5329	Inspection and test reports	----

The above DID's were those cleared as of the date of this specification. The current issue of DoD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DID's are cited on the DD Form 1423.

6.3.1 Where the Government has limited rights in the data shown on the drawings, as determined by the contractural provisions regarding rights in technical data, the drawings may be marked with a legend. If used, the "Limited Rights Legend" of FAR should be used.

6.4 Technical manuals. The requirement for technical manuals should be considered when this specification is applied on a contract. If technical manuals are required, military specifications and standards that have been cleared and listed in DoD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL) must be listed on a separate Contract Data Requirements List (DD Form 1423), which is included as an exhibit to the contract. The technical manuals must be acquired under separate contract line item in the contract. Technical content should include the requirements of the appendix C, titled "Manual Technical Content Requirements".

6.5 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Products List No. 18110 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Naval Sea Systems Command, SEA 55Z3, Department of the Navy, Washington, DC 20362-5101, and information pertaining to qualification of products may be obtained from that activity. Application for qualification tests must be made in accordance with "Provisions Governing Qualification SD-6" (see 6.5.1).

6.5.1 Copies of "Provision Governing Qualification SD-6" may be obtained upon application to Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

6.6 First article. When first article inspection is required, the contracting officer should provide specific guidance to offerors whether the item(s) should be a preproduction sample, a first article sample, a first production item, a sample selected from the first ____ production items, a standard production item from the contractor's current inventory (see 3.2), and the number of items to be tested as specified in 4.3. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results, and disposition of first articles. 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. Bidders should not submit alternate bids unless specifically requested to do so in the solicitation.

6.6.1 For those products requiring first article inspection, contractors should contact their Government inspector to make arrangements for monitoring the tests.

6.7 Provisioning. Provisioning Technical Documentation (PTD), spare parts, and repair parts should be furnished as specified in the contract.

6.7.1 When ordering spare parts or repair parts for the equipment covered by this specification, the contract should state that such spare parts and repair parts should meet the same requirements and quality assurance provisions as the parts used in the manufacture of the equipment. Packaging for such parts should also be specified.

6.8 Sub-contracted material and parts. The packaging or preparation for delivery requirements of referenced documents listed in section 2 do not apply when material and parts are acquired by the contractor for incorporation into the equipment and lose their separate identity when the equipment is shipped.

6.9 Subject term (key word) listing.

Bonnet
Bosses
Flow coefficient
Valve seat
Water way
Yoke

6.10 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.

Preparing activity:
Navy - SH
(Project 4820-0448)

APPENDIX A

ENGINEERING DRAWINGS TECHNICAL CONTENT REQUIREMENTS

10. SCOPE

10.1 Scope. This appendix covers the technical requirements that shall be included on drawings when required by the contract or order. This appendix is mandatory only when data item description DI-DRPR-80651 is cited on the DD Form 1423.

20. APPLICABLE DOCUMENTS

20.1 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
B46.1 - Surface Texture (Surface Roughness, Waviness, and Lay). (DoD adopted)
Y14.5 - Dimensioning and Tolerancing. (DoD adopted)

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

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

30. DRAWINGS

30.1 Drawings. When required by the contract or order, drawings shall contain the following information:

(a) Drawings showing a scaled sectional assembly which clearly depicts the design and construction of the valves, including actuator if supplied with the valve.
(b) Bill of material listing specification, grade, condition, and any other data required to fully identify the properties of the materials proposed.
(c) Detail drawings of parts and subassemblies necessary for evaluation of the equipment and parts necessary for maintenance and overhaul of the valve. Details of these parts shall be complete as to permit emergency manufacture by a Naval shipyard without assistance from the original manufacturer. Subassembly parts which cannot be acquired or serviced individually shall be shown as a single part and so indicated. Multidetail drawings are preferred, but monodetail drawings may be used.

(d) Layout of the pressure-containing envelope (body and bonnet) giving dimensions which control compression of the spiral-wound gaskets and pressure seal ring. This is to assure that where remachining is necessary to repair the gasket sealing surfaces on these parts, compensating cuts can be accurately made to restore original gasket compression. This layout shall also specify the dimensional limits of such corrective remachining within which function of the valve remains unaffected.
(e) Recommended assembly torques, or equivalent procedures, for making up all joints and threaded assemblies.
(f) Tabulation of required gasket characteristics, including all dimensions (with tolerances) and load versus compression characteristics (with tolerances).
(g) Mark areas to be radiographic, magnetic particle, or dye-penetrant inspected.
(h) Dimensions - overall in accordance with ANSI Y14.5; accessibility space, including disassembly clearances and all dimensions pertinent to installation.
(i) Surface finishes in accordance with ANSI B46.1 and bearing areas.
(j) Name of laboratory conducting tests and date of previous successful shock and vibration tests.
(k) Location of center of gravity.
(l) Calculated weight.
(m) Welding procedure for seal canopy.

(1) Detail of weld.
(2) Welding process.
(3) Welding current (where applicable).
(4) Filler metal.
(5) Preparation.
(6) Interpass temperature.
(7) Technique.
(8) Post heat treatment.
(9) Provide a table listing size of weld, number of passes, electrode diameter, and welding characteristics.

(n) Installation and maintenance dimensions, overall dimensions, accessibility space including disassembly clearance and overall dimension pertinent to installation.

APPENDIX B

CERTIFICATION/DATA REPORT TECHNICAL CONTENT REQUIREMENTS

10. SCOPE

10.1 Scope. This appendix covers the technical requirements that shall be included in certification/data reports when required by the contract or order. This appendix is mandatory only when data item description DI-MISC-80678 is cited on the DD Form 1423.

20. APPLICABLE DOCUMENTS

This section is not applicable to this appendix.

30. CERTIFICATION

30.1 Certification. When required by the contract or order, certification data sheets shall contain the following information:

(a) Class and composition.
(b) Pressure and temperature rating.
(c) Body and bonnet material.
(d) Seat, disc, and steam material.
(e) Type of actuator, if required.
(f) Shock, noise and vibration tests of valve with the power actuator attached.

APPENDIX C

MANUAL TECHNICAL CONTENT REQUIREMENTS

10. SCOPE

10.1 Scope. This appendix covers the technical requirements that shall be included in the manuals when required by the contract or order.

20. APPLICABLE DOCUMENTS

This section is not applicable to this appendix.

30. MANUALS

30.1 Manuals. When required by the contract or order, manuals shall contain the following information:

(a) Drawings for the valve (including certification/data report). Drawings shall be supplemented by additional illustrations, where necessary, to adequately illustrate operation and maintenance. Those additional illustrations may consist of blowouts, partial or full sections, and so forth and may eliminate extraneous lines and details to clarify the interaction of parts.
(b) Table listing wrench sizes and assembly torques (or other equivalent procedures) for making up all joints and threaded assemblies.
(c) Instructions to permit overhaul by shipyard or other repair facility. These should include procedures for checking all critical dimensions subject to wear or change and the acceptable dimensional limits, surface finish condition, and so forth. Also, the appropriate procedure (that is, part replacement, correction at repair facility, or repair at manufacturer's facility) which should be followed to correct each case of damage or wear.
(d) Detailed disassembly and reassembly procedures. In addition to providing procedures for the complete disassembly and reassembly of the equipment, maintenance and troubleshooting sections shall contain, or refer to, only the limited disassembly and reassembly required to accomplish each particular operation. This is intended to reduce the possibility of unnecessary disassembly and unnecessary disturbance of adjustments when performing specific or limited maintenance or troubleshooting operations.
(e) Adjustment procedures.
(f) Seal welding procedure, if applicable.
(g) List detailing oversize seal rings for repair purposes.

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-V-18110	2. DOCUMENT DATE (YYMMDD) 19 February 1991

3. DOCUMENT TITLE
VALVES, GATE TYPE, STEEL (sizes 2 - 1/2 inches to 16 inches)

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (If applicable)	7. DATE SUBMITTED (YYMMDD)

8. PREPARING ACTIVITY

a. NAME Technical Point of Contact (TPOC): Mr. Fred Tsao (SEA 56Y234) PLEASE ADRESS ALL CORRESPONDENCE AS FOLLOWS:	b. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON TPOC: 703-602-0367 8-332-0367
c. ADDRESS (Include Zip Code) Commander, Naval Sea Systems Command Department of the Navy (SEA 55Z3) Washington, DC 20362-5101	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340