INCH-POUND
MIL-V-3E
1 November 1994
SUPERSEDING
MIL-V-3D
3 July 1985
(See 6.9)

MILITARY SPECIFICATION

VALVES, FITTINGS, AND FLANGES (EXCEPT FOR SYSTEMS INDICATED HEREIN); PACKAGING OF

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

1. SCOPE

1.1 Scope. This specification covers the requirements for the packaging (preservation, packing, and marking) of hardware valves such as globe valves, angle valves, check valves, cross valves, cylinder valves, gate valves, relief valves, and associated fittings and flanges for shipment and storage. This document does not provide packaging requirements for valves, fittings, and flanges intended for use in gas generating, fluid, and pneumatic systems with cleanliness and preservation requirement standards exceeding those specified herein.

1.2 Levels of protection.

1.2.1 Preservation.

Level A (see 3.8.1.1).
Level C (see 3.8.1.2).
Commercial (see 3.8.1.3).

1.2.2 Packing.

Level A (see 3.8.2, 3.8.2.1, and 3.8.2.6).
Level B (see 3.8.2, 3.8.2.1, and 3.8.2.6).
Level C (see 3.8.2, 3.8.2.1, and 3.8.2.6).
Commercial (see 3.8.3).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, SEA 03R42, Naval Sea Systems Command, 2531 Jefferson Davis Hwy, Arlington, VA 22242-5160 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 AREA PACK

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifi-cations, 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

UU-P-268	- Paper, Kraft, Wrapping.
PPP-B-1055	- Barrier Material, Waterproofed, Flexible.

MILITARY

MIL-P-116	- Preservation, Methods of.
MIL-B-121	- Barrier Material, Greaseproofed, Waterproofed, Flexible.
MIL-P-149	- Plastic Coating Compound, Strippable (Hot Dipping).
MIL-S-196	- Support Items, Accessories, and Kits, Mechanical; Packaging of.
MIL-P-4861	- Packing, Preformed, Rubber: Packaging of.
MIL-C-5501	- Caps and Plugs, Protective, Dust and Moisture Seal, General Specification for.
MIL-L-19140	- Lumber and Plywood, Fire-Retardant Treated.
MIL-P-23242	- Plastic Coating Compound, Strippable, for Electroplating.
MIL-A-25175	- Air Transport, Nontactical, Packing for.

STANDARDS

MILITARY

MIL-STD-129	- Marking for Shipment and Storage.
MIL-STD-740-1	- Airborne Sound Measurements and Acceptance Criteria of Shipboard Equipment.
MIL-STD-740-2	- Structureborne Vibratory Acceleration Measurements and Acceptance Criteria of Shipboard Equipment.
MIL-STD-1186	- Cushioning, Anchoring, Bracing, Blocking and Waterproofing; with Appropriate Test Methods.
MIL-STD-2073	- DoD Material Procedures for Development and Application of Packaging Requirements.

(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.

PUBLICATIONS

DEPARTMENT OF LABOR (DOL)
Code of Federal Regulations, Title 29,
Part 1910, Section 145 and 1001 - Occupational Safety and Health Standards.

(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

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)
MH15.1 - Glossary of Packaging Terms.

(Application for copies should be addressed to the American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
D 996 - Standard Terminology of Packaging and Distribution Environments. (DoD adopted)
D 1974 - Methods of Closing, sealing, and Reinforcing Fiberboard Shipping Containers.
D 3951 - Standard Practice for Commercial Packaging. (DoD adopted)
D 4727 - Fiberboard, Correugated and Solid, Sheet Stock (Container Grade) and Cut Shapes.
D 5118 - Practice For Fabrication of Fiberboard Shipping Boxes.

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

(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 Definitions or explanation of packaging terms. Definitions or explanation of packaging terms, applicable to this specification, shall be as specified in 6.5. For definitions or explanation of packaging terms not specified therein, ANSI MH15.1 and ASTM D 996 shall apply.

3.2 Order of precedence. When an equipment or item is acquired in conformance to a commodity specification having detailed packaging or preparation for delivery requirements which differ from this specification, the packaging or preparation for delivery specified in the commodity specification shall apply.

3.3 Materials. Packaging materials shall be as specified herein and in the applicable referenced specifications.

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.

3.3.2 New materials. The use of newly developed packaging materials or procedures is encouraged and recommended and will be permitted under the conditions specified herein, provided they are equal or better than the specified materials or procedures.

3.3.2.1 Certification of new materials. If the contractor desires to use materials or procedures other than those specified herein, he shall furnish to the contracting activity documented evidence, certified by a testing laboratory, satisfactory to the contracting activity, that the material or procedure is equal to or exceeds the requirements specified herein. If, after a review of the material (see 6.3) or procedure and the related certified test report or the witnessing of the stipulated tests, it is the opinion of the contracting activity that the material or procedure meets or exceeds the requirements specified herein, authorization for use will be granted.

3.3.3 Asbestos. The use of asbestos or material and items containing asbestos shall be as specified in 3.3.3.1 and 3.3.3.2 (see 6.6).

3.3.3.1 Packaging materials. Asbestos or material and items containing asbestos shall not be used in the packaging process.

3.3.3.2 Packaged items. Asbestos and separately packaged components containing asbestos that is predominately distributed throughout the item and expected to produce dust in excess of OSHA exposure limits shall be packaged in sealed, dust and siftproof packages. Flexible packages shall be heat-sealed. All packages shall be marked as specified in 3.11.1.2.

3.3.4 Talc/talcum. When used in the packaging process, in dusting for example, talc/talcum shall be asbestos free (see 3.3.3.1) (see 6.3).

3.3.5 Cushioning and wrapping materials. Use of excelsior, newspaper, shredded paper (all types, including wax paper), and similar hygroscopic or non-neutral materials and all types of loose-fill materials, including polystyrene, is prohibited for applications such as cushioning, fill, stuffing, and dunnage. Unless otherwise specified (see 6.2), materials selected for cushioning and wrapping shall have properties (characteristics) resistant to fire. Kraft paper conforming to UU-P-268, type II, grade C or D are acceptable wrapping materials under this requirement.

3.4 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 6.4) in accordance with 4.3.

3.4.1 Dummy or simulated load. When specified (see 6.2), a dummy or simulated load may be used for the rough handling tests (see 4.3.2). When the actual equipment or items is used, or when a dummy or simulated load is substituted for the actual equipment or item in performing the rough handling tests, instrumentation of the pack is required for assurance that the acceleration of the packaged item during the tests is less than the fragility rating of the part or item. The details of the instrumentation, including location, shall be noted (see 4.3).

3.5 Technical data. Complete descriptive packaging details on drawings, test(s) results, and packaging and transportation data requirements are not required when such were previously submitted to and accepted by the contracting activity (see 6.3 and appendix).

3.6 Disassembly. Equipment disassembly shall be the minimum necessary to make accessible for cleaning, drying, and preservation of equipment and its machined or critical surfaces. Removal of secondary assemblies, accessories, and projecting parts which will facilitate protection of the equipment from damage, pilferage, and loss, or reduction of cube is permitted where such removal will not affect permanent settings or alignments, and where the removed part can be readily assembled at the installation site without the need for special tools or gauges. Unless otherwise specified (see 6.2) handwheels shall be removed from (1) valves exceeding 20 pounds and (2) where the hand wheel exceeds the valve body dimensions. After removal, the handwheel shall be separately preserved and packed within the same container as the valve. Alternately, the handwheel may be tightly and securely wired or strapped to the valve. The stem end shall be provided, as necessary, with a metal or plastic nipple or wood block, nut, and washer. When a wood block is used, the stem shall be overwrapped with a neutral greaseproof, waterproof barrier material prior to applying the wood block. Removed hardware (bolts, nuts, pins, screws, washers, and others) shall be reinstalled in mating parts and secured to prevent their loss. Removed parts or items, other than hardware, shall be packaged to the same level of protection as the basic or prime equipment. Detached components shall be included within the same container as the basic unit.

3.7 Matchmarking. Removed parts or items, except hardware, shall be matchmarked to facilitate reassembly. Removed parts or items shall be tagged, marked, and tags attached to each mating part or item. The tags and printing thereon shall be resistant to water, oils, and fading.

3.8 Level of protection.

3.8.1 Preservation. Preservation (unit protection) shall be level A, C, or commercial, as specified (see 6.2).

3.8.1.1 Level A.

3.8.1.1.1 Cleaning and drying. Valves, fittings, and flanges shall be cleaned and dried in accordance with Method C-1 of MIL-P-116.

3.8.1.1.2 Preservation requirements.

3.8.1.1.2.1 Valves of ferrous or aluminum construction. Valves of ferrous or aluminum construction shall be preserved by method I of MIL-P-116. Internal ferrous or aluminum surfaces shall be sprayed or flushed with preservative type P-2, P-3, P-7, P-9, P-10, P-15, or P-21 of MIL-P-116, as specified (see 6.2). Unless otherwise specified (see 6.2), valves intended for operation in steam or water systems shall be sprayed or flushed internally with preservative type P-3 or P-21 of MIL-P-116. Valves intended for hydraulic systems shall be sprayed or flushed with preservative type P-15 of MIL-P-116. External surfaces of movable parts shall be coated with preservative type P-2 or P-7 of MIL-P-116. When removal of the preservative film can be readily accomplished without damage to the item or where removal of the preservative is not required in order to place the item in use, external unpainted, unplated, or otherwise unprotected surfaces shall be coated with preservative type P-1 or P-19 of MIL-P-116. When the specific type of preservative is not specified in the contract, order, or item specification for internal preservation of valves not intended for operation in steam or water, the selection from the preservatives specified herein shall be at the option of the contractor.

3.8.1.1.2.2 Valves of nonferrous (except aluminum) construction. Unless otherwise specified (see 6.2), valves of nonferrous (except aluminum (see 3.8.1.1.3.1)) construction shall be protected by method III of MIL-P-116. Contact preservatives will not be required.

3.8.1.1.2.3 Fittings and flanges. Unless otherwise specified (see 6.2), machined surfaces of fittings and flanges shall be preserved, as specified in 3.8.1.1.2.1, for protection of external surfaces as applicable for the materials used in construction. Fittings and flanges which are plated or coated, providing protection equivalent to method I of MIL-P-116, will not require a contact preservative and shall be packaged in accordance with method III of MIL-P-116. Unless otherwise specified (see 6.2), brazing fittings shall be unit protected with tight fitting plastic caps, conforming to MIL-C-5501, or with a hot dip non-oil exuding strippable plastic coating compound, conforming to MIL-P-23242. The compound dipping temperature at the time of application shall be 365 ± 10 degrees Fahrenheit (°F).

3.8.1.1.2.4 Rings. When furnished loose with a fitting, metal and rubber rings, such as back up or brazing rings, shall be individually unit protected and packed with the fitting. Silver brazing rings shall be preserved method IC or metal rings method III in accordance with MIL-P-116. Rubber O-rings shall be individually preserved in accordance with MIL-P-4861. Multiple quantities of rings furnished separate from the fittings shall be unit protected, as specified herein, and packed in containers specified in 3.8.1.1.3.4.

3.8.1.1.2.5 Removal of packing material. When specified (see 6.2), valves having stems of ferrous materials, except preset, automatic, or relief valves, shall have the packing removed prior to cleaning and the application of preservative compounds. The required packing material shall be separately packaged, in accordance with method IC-1 of MIL-P-116. The bag containing the packing materials shall be securely fastened to the individual valve, by taping or tying, and the valve shall be marked with precautionary information requiring the installation of the packing material prior to placing the valve in use.

3.8.1.1.3 Unit protection.

3.8.1.1.3.1 Valves - sealed openings. Valves which are not wrapped or boxed as a part of the packaging procedure shall have all ports or other openings to the interior of the valve sealed with plastic, metal or wood caps, plugs, or flange covers to prevent entrance of dust or other foreign materials. When metal or wood flange covers, or metal or wood plugs are used, a neutral greaseproof waterproof barrier material shall be inserted between the plug or flange covers and the valve port or opening. Metal plugs or flange covers, when used, shall be protected against corrosion by painting or by the use of type P-1 or P-19 preservative compound of MIL-P-116.

3.8.1.1.3.2 Preparation. Care shall be taken to insure that external moving parts are cushioned and protected from damage. Male threads of air-tested fittings shall be protected with plastic or paperboard sleeves, metal caps, or as an alternate, may be protected by dipping in material conforming to type II of MIL-P-149, where this material can be readily removed. Alternatively, when a dry surface is desirable, coating compound conforming to MIL-P-23242 may be used. Surfaces of plugs, seals, or other types of protectors shall be neutral and acid free, as defined in MIL-B-121, and shall be greaseproof when in contact with preservative compounds.

3.8.1.1.3.3 Use of overwrapping with greaseproof material. Exterior surfaces of valves, fittings, or flanges coated with soft film preservatives shall be wrapped with greaseproof barrier material in accordance with MIL-P-116. No overwrapping with greaseproof material will be required for surfaces coated with type P-1 or P-19 preservative of MIL-P-116. Barrier material shall be secured in place with pressure-sensitive tape.

3.8.1.1.3.4 Valves, fittings, and flanges weighing 20 pounds or less. Unless otherwise specified (see 6.2), valves, fittings, and flanges weighing 20 pounds or less shall be unit packed in quantities as specified in waterproof or weather-resistant paperboard folding, set-up, metal stayed or fiberboard boxes seleted from MIL-STD-2073-2, Table VII, "Unit and Intermediate Container Codes", with box selection at the option of the contractor. Box closure shall be as specified in the applicable box specification or appendix thereto with method V closure applicable to fiberboard boxes. Where weather-resistant type boxes are not available, boxes shall be overwrapped with waterproof barrier material and sealed to provide weather resistant protection. The gross weight of paperboard boxes shall be not greater than 10 pounds; for fiberboard boxes 20 pounds.

3.8.1.1.3.5 Valves, fittings, and flanges weighing more than 20 pounds. Valves, fittings, and flanges weighing more than 20 pounds shall be individually packed directly into shipping containers. Containers selection shall be from Table IX of MIL-STD-2073-2, as required for the level of packing specified.

3.8.1.2 Level C. Valves, fittings, and flanges shall be preserved as specified for level A (see 3.8.1.1) except that unit containers (see 3.8.1.1.3.4) shall be as follows:

(a) Paperboard containers shall be of the domestic or non-weather resistant type, class or variety, as applicable and,
(b) The fiberboard box shall be of the class-domestic/fire-retardant material (see 3.8.2.3(b)). The box closure shall be in accordance with method I using pressure-sensitive adhesive tape.

3.8.1.3 Commercial. Valves, fittings, and flanges shall be preserved (unit protected) in accordance with ASTM D 3951.

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

3.8.2.1 General requirements for levels A, B, and C. Shipping containers shall be of a minimum weight and cube, consistent with the requirements of this specification. Containers listed herein shall not preclude the use of other containers not listed, provided they meet the requirements of the individual container and have been approved by the contracting activity. Shipping containers, when packed with the same items, shall be of similar construction, of uniform size, and of minimum cube and tare, consistent with protection required, and shall contain identical quantities of identical items when practicable. Items packaged in a container designed as a shipping container shall be cushioned, blocked, braced, and anchored to prevent movement and damage and shall meet the rough handling test as specified (see 4.3.2). Wood, plywood, or cleated containers shall be used for an individual item weighing 150 pounds or more and for items secured to the base and skids, or equivalent reinforcements, with hexhead or carriage bolts whenever practicable . Crates shall be used for the shipment of individual items exceeding the weight limitation specified for wood and plywood container specification. Open crates shall be used only for the shipment of items which are not readily susceptible to damage from outside forces and which require only limited protection. In general, items which are designated for outdoor installation and use, or which are of rugged construction, may be advantageously shipped in open crates and, unless otherwise specified (see 6.2), shall be shrouded with flexible waterproof barrier material conforming to PPP-B-1055. The multiple packing of items of different stock numbers will not be permitted in shipping containers, unless the items of each stock number are intermediate packaged in fiberboard boxes as specified in 3.8.1.1.3.4.

3.8.2.2 Critical close tolerance equipment. In addition to any preservation and packing requirements specified by the product specification or packaging requirements code, equipments which are certified to MIL-STD-740-1 or MIL-STD-740-2, as applicable, shall be protected against damage resulting from environmental conditions, multiple handling and the hazards of transportation (rough handling, shock, vibration, etc.). Shipping containers or method of packing utilizing shock and/or vibration mitigation systems shall only use mounts which have "captive features" incorporated in their design. Unit packs and shipping containers shall be marked as specified (see 3.11.1.3).

3.8.2.3 Navy fire-retardant requirements.

(a) Treated lumber and plywood. Unless otherwise specified (see 6.2), all lumber and plywood including laminated veneer material used in shipping container and pallet 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.

(b) Fiberboard. Fiberboard used in the construction of unit containers shall be of class-domestic, non-weather resistant fiberboard and cleated fiberboard boxes including interior packing forms (see 3.8.1.2(b)) and shall meet the flamespread index and the specific optic density requirements of ASTM-D-4727 and amendment thereto.

3.8.2.4 Air shipment. Packing for air shipment shall be in accordance with MIL-A-25175. Supplemental information is provided in 6.7.

3.8.2.5 Cushioning, anchoring, blocking, bracing, and waterproofing. Cushioning, anchoring, blocking, bracing and waterproofing of container contents shall be in accordance with MIL-STD-1186, MIL-P-116, and the applicable container specification or appendix thereto. Material used should provide minimum volume packaging, and shall not use plastic material unless required to provide necessary degree of physical, mechanical or environmental protection. Supplemental information is provided in 6.7.

3.8.2.6 Levels A, B, and C containers. Material preserved as specified (see 3.8.1.1.2), shall be packed in exterior shipping containers for the level of packing specified (see 3.8.2), in accordance with table VII, "Exterior shipping container requirements.", of MIL-STD-2073-1, appendix C and herein. Unless otherwise specified (see 6.2), container selection and options shall be at the contractor's option. Interior fiberboard boxes (see 3.8.1.1.3.4) closed, sealed and banded as specified herein and used as level B or C shipping packs need not be overpacked.

3.8.2.6.1 Caseliners, closure, and gross weight.

3.8.2.6.1.1 Caseliners. Unless otherwise specified (see 6.2), level A shipping containers containing items preserved level C or commercial shall be provided with waterproof caseliners and sealed in accordance with MIL-STD-2073-1. When containers are packed with products or interior packs meeting the following requirements, no caseliner will be required:

(a) Items which are completely painted and have no unprotected critical surfaces.
(b) Large items which are completely coated with paint or preservative type P-1 or P-19, and where the critical interior surfaces are preserved and all openings sealed.
(c) Method IA and IC packs.

(d) Method II packs when all materials exterior to the water-vapor barrier have water resistance equal to or exceeding the water resistance requirements of ASTM D 5118 fiberboard boxes, Grades V or W.
(e) Intermediate packs (or unit packs when no intermediate pack is required) for which the container conforms to weather-resistant class in accordance with ASTM D 5118, and is closed, sealed and banded as specified in 3.8.2.6.1.2.

3.8.2.6.1.2 Closure. Container closure, reinforcing, or banding shall be in accordance with ASTM D 1974. Weather-resistant fiberboard boxes shall be closed in accordance with method 2B3, 4 or 6 and reinforced with non-metallic strapping or reinforced tape banding. Domestic or fire retardant fiberboard boxes shall be closed in accordance with any 2B closure method using pressure-sensitive tape.

3.8.2.6.1.3 Weight. Wood, plywood, and cleated type containers exceeding 150 pounds gross weight (see 3.8.2.1) shall be modified by the addition of skids, or a skid or sill type base in accordance with MIL-STD-2073-1 and the applicable container specification or appendix thereto.

3.8.2.6.2 Fittings and flanges weighing more than 20 pounds. Fittings and flanges weighing more than 20 pounds shall be packed for the level specified in 3.8.2.6, except that flanges that can be effectively packed by bundling may be stacked and securely bolted in bundles face to face, or hub to hub, with flanged face out and with outer flange faces fully protected by wood, pressed wood, metal, or similar flange covers bolted to the face. When wood or metal flange covers are used, a neutral greaseproof barrier material shall be inserted between the flange face and the flange cover. When metal covers are used, they shall be painted or protected against corrosion with a preservative compound as specified in 3.8.1.1.3.1. Fittings weighing over 50 pounds, except butt welding or silver brazing fittings which do not require packing for physical protection, shall have flange faces of fittings protected in the same manner as flanges. Soil pipe or case-iron water pipe fittings and flanges in volt-face bundles may be shipped unpacked or may be strapped on pallets to facilitate handling.

3.8.3 Commercial packing. Commercial packing shall be in accordance with ASTM D 3951 and herein.

3.8.3.1 Container modification. Shipping containers exceeding 150 pounds gross weight shall have a minimum of two, 3-inch by 4-inch nominal wood skids laid flat, or a skid and sill type base which will support the material and facilitate handling by mechanical handling equipment during shipment, stowage and storage.

3.9 Provisioned items (repair parts). Provisioned items (repair parts) shall be preserved, packed, and marked in accordance with MIL-S-196 for the level specified (see 6.2).

3.10 Palletization. Unless otherwise specified (see 6.2) material shall be palletized in accordance with MIL-STD-2073-1 when one of the following criteria is met.

(a) Load shall consist of four or more unskidded containers.
(b) The load shall utilize a minimum of 80 percent of the pallet base.

3.11 Marking. In addition to any special marking required (see 6.2), markings shall be in accordance with MIL-STD-129.

3.11.1 Special marking. In addition to the markings as specified in 3.11, the following shall apply.

3.11.1.1 O-rings. Interior packs containing O-rings shall be marked in accordance with MIL-P-4861.

3.11.1.2 Asbestos items. An asbestos caution label shall be affixed to each interior (unit and intermediate) pack and shipping container (see 3.3.3 through 3.3.3.2). The caution label shall conform to 29 CFR, part 1910, section 145 and 1001. The caution label shall state the following:

"CAUTION

CONTAINS ASBESTOS FIBERS,
AVOID CREATING DUST.
BREATHING ASBESTOS DUST
MAY CAUSE SERIOUS BODILY HARM."

3.11.1.3 Critical close tolerance equipment. Unit packs, shipping containers, and unpacked shipments of noise tested equipments (see 3.8.2.2) shall be marked with the following:

"CRITICAL, CLOSE TOLERANCE
OPERATING EQUIPMENT
HANDLE WITH CARE
DO NOT DROP OR SUBJECT
TO SHOCKS OR JARS"

Markings shall be stencilled, red color, and applied on two sides and both ends of the container or shipment. Letters shall be of minimum 1-1/2 inches high, except for small containers with insufficient space, in which case letters shall be of such size as to be legible. In addition, arrows and the word, "UP", center of balance, sling or lifting point markings as indicated in MIL-STD-2073-1 shall apply.

3.12 Special instruction.

3.12.1 Technical manuals. Technical manuals, which accompany shipments that are packed level A, B, or C shall be packaged in transparent waterproof plastic bags, minimum 4 mil thick. Closure shall be by heat sealing. For Army, technical manuals shall be packed in accordance with method IC-1 of MIL-P-116. Technical manuals shall not be packed within any sealed flexible barrier material used to enclose the item(s). Packing lists shall indicate that a technical manual is enclosed, and shall also state the approximate location therein. For ease of removeability, the location of the manuals shall be such that they are readily accessible when the container is opened. Technical manuals, when shipped in bulk quantities, shall not be individually wrapped, but shall be packed in accordance with the requirements of the applicable technical manual specification or packed in containers conforming to the requirements for level A, B, C, or commercial as specified (see 6.2).

3.13 Workmanship. All operations and processes involved in accomplishing the cleaning, preservation, packaging, packing, and marking requirements specified herein, shall be in accordance with the highest grade practice associated with this type of work.

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

4.3 First article. First article inspection shall be as specified in 4.3.1 and 4.3.2 (see 6.3).

4.3.1 First article inspection. The contractor shall conduct inspection on one complete package, packed for shipment, to ascertain that the cleaning, drying, preservation, packaging, packing, and marking of the item conforms to this specification. The first article sample will not be required when such a pack has previously been inspected and accepted for the same method for an identical or similar item, by the same contractors, and satisfactory evidence can be furnished to the Government that the equipment or items have been prepared identically. First article inspection shall be repeated when changes in preservation and packing materials, processes, or designs are made.

4.3.2 First article testing for levels A and B protection. When specified (see 6.2), a complete pack of item or equipment shall be subjected to the examination and tests of MIL-P-116, including the rough handling test and tables III, IV, and V as applicable, therein. When specified (see 6.2), a dummy or simulated load packaged for shipment may be used for the rough handling tests.

4.3.2.1 First article test exceptions. A first article test will not be required when:

(a) Commercial packaging is specified.
(b) Commercial packing is specified.
(c) Detailed packaging instructions are furnished by the contracting activity.
(d) Previous submittal (see 4.3.1).

4.4 Quality conformance inspection. Sample items, packages, and packs shall be selected and inspected in accordance with MIL-P-116 to verify conformance to the requirements of section 3 herein.

4.4.1 Packing and marking. Examination of the packing and marking requirements not covered by any specification referenced shall be performed on the delivery lot at 100 percent level of inspection. Any pack offered for delivery having one or more defect shall not be accepted. Defects are classified as specified in table I.

TABLE I. Classification of defects.

Major	Defects	Level			Commercial
		A	B	C	
101	Materials and methods not as specified.	X	X	X	-
102	Lack of or incorrect use of cushioning and wrapping materials (see 3.3.5, and 3.8.1.1.3.3).	X	X	X	X
103	Complete descriptive packaging, packing, or drawings of sample pack not submitted (see 3.5).	X	X	X	-
104	Packing data not submitted (see 3.5).	X	X	X	-
105	Items not properly cleaned in accordance with MIL-P-116 (see 3.8.1.1.1).	X	-	X	-
106	Preservatives improperly applied and exterior surfaces not coated with correct preservative (see 3.8.1.1.2).	X	-	X	-
107	Openings not sealed as specified (see 3.8.1.1.2.2).	X	-	X	-
108	Valves of nonferrous construction not protected by method III of MIL-P-116 (see 3.8.1.1.2.2).	X	-	X	-
109	Valve stems of ferrous materials (other than preset, automatic, or relief valves) incorrectly processed and packing not removed (see 3.8.1.1.2.5).	X	-	X	-
110	Level of preservation and level of packing not as specified (see 3.8.1 and 3.8.2.).	X	X	X	X
111	Unsealed case liners (see 3.8.2.6.1.1).	X	X	-	-
112	Boxes not modified when gross weight exceeds 150 pounds (see 3.8.2.1 and 3.8.3.1).	X	X	X	X
113	Marking illegible, incomplete, or incorrect (see 3.11).	X	X	X	X
114	Repair parts not packaged as specified (3.9).	X	X	X	X
115	Palletization not as specified (see 3.10).	X	X	X	X
116	Critical close tolerance equipment not protected as specified (see 3.8.2.2).	X	X	X	X
117	For Navy, fire-retardant materials not provided or as specified (see 3.8.2.3).	X	X	X	X

5. PACKAGING

5.1 This section is not applicable to this specification.

6. NOTES

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

6.1 Intended use. The cleaning, drying, preservation, packing, and marking requirements specified herein are intended to insure proper and safe storage and transportation for mechanical valves, fittings, and flanges not installed as a component of equipment. It is not intended to provide complete delivery requirements for valves having hydraulic or electrical activating mechanisms or controls. Additional information or special requirements may be required for peculiar types of valves.

6.2 Acquisition requirements. Acquisition documents must specify the following:

(a) Title, number, and date of this specification.
(b) 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).
(c) When materials do not require fire resistant characteristics (see 3.8.2.3).
(d) When first article sample is required (see 3.4 and 4.3.2).
(e) When a dummy or simulated load may be used for the rough handling tests (see 3.4.1 and 4.3.2).
(f) When hand wheels are not to be removed (see 3.6).
(g) Levels of protection required (see 3.8.1, 3.8.2, 3.9, and 3.12.1).
(h) Type of preservative other than specified for steam or water-system valves (see 3.8.1.1.2.1).
(i) When protection other than method III of MIL-P-116 may be used (see 3.8.1.1.2.2).
(j) Preservation other than specified for machined surfaces of fittings and flanges (see 3.8.1.1.2.3).
(k) Unit protection (preservation) requirements other than specified for brazing fittings (see 3.8.1.1.2.3).
(l) When removal of packing is required (see 3.8.1.1.2.5).
(m) When the unit pack quantity is other than commercial (see 3.8.1.1.3.4).
(n) When container selection is other than the contractor's option (see 3.8.1.1.3.4 and 3.8.2.6).
(o) When items shipped in open crates do not require a flexible waterproof barrier (see 3.8.2.1).
(p) When fire-retardant requirements are other than as specified (see 3.8.2.3(a)).
(q) When caseliners are not required (see 3.8.2.6.1.1).
(r) Level of preservation and packing required for provisioned items (see 3.9).
(s) When palletization per the criteria is not required (see 3.10).
(t) Special marking required (see 3.11).
(u) When bar code markings are not required (see 3.11).

6.3 Consideration of data requirements. The following data requirements should be considered when this specification is applied to a contract. The applicable Data Item Descriptions (DIDs) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DIDs 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 requirements for a DD Form 1423.

Reference paragraph	DID Number	DID Title	Suggested Tailoring
3.3.2.1 and 3.3.4	DI-MISC-80678	Certification/data report	10.3.1 does not apply
3.5 and appendix	DI-DRPR-80651	Engineering drawings	Level 2 for preliminary design- Level 3 for final drawings- Drawing number - contractor Design activity - designation Contractor - parts lists required - certification data sheets
3.5 and 4.3	DI-NDTI-80809	Test/inspection reports	----
3.5	DI-PACK-80120	Preservation and packing data	----

The above DIDs 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 DIDs are cited on the DD Form 1423.

6.4 First article inspection. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection as 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.

6.5 Definitions or explanation of terms.

6.5.1 Levels of protection. The following levels of protection apply equally to preservation and packing.

6.5.1.1 Level A. This packaging provides maximum protection. It is needed to protect material under the most severe worldwide shipment, handling, and storage conditions. Preservation and packing will be designed to protect material against direct exposure to extremes of climate, terrain, and operational and transportation environments, without protection other than that provided by the pack. The conditions to be considered include, but are not limited to:

(a) Multiple handling during transportation and intransit storage from point of origin to ultimate user.
(b) Shock, vibration, and static loading during shipment.
(c) Loading on shipdeck, transfer at sea, helicopter delivery, and offshore or over-the-beach discharge, to final user.
(d) Environmental exposure during shipment or during intransit operations where port and warehouse facilities are limited or nonexistent.
(e) Outdoor storage in all climatic conditions for a minimum of 1 year.
(f) Static loads imposed by stacking.

NOTE: For packing (exterior containers) it has been determined and agreed upon by the joint DoD packaging administrators that fiberboard and paperboard are not an acceptable material for use under level A packing.

6.5.1.2 Level B. This packaging provides intermediate protection. It is needed to protect material under anticipated favorable environmental conditions of worldwide shipment, handling, and storage. Preservation and packing will be designed to protect material against physical damage and deterioration during favorable conditions of shipment, handling, and storage. The conditions to be considered include, but are not limited to:

(a) Multiple handling during transportation and intransit storage.
(b) Shock, vibration, and static loading of shipments worldwide by truck, rail, aircraft, or ocean transport.
(c) Favorable warehouse environment for a minimum of 18 months.
(d) Environmental exposure during shipment and intransit transfers, excluding deck loading and offshore cargo discharge.
(e) Stacking and supporting superimposed loads during shipment and extended storage.

NOTE: For packing (exterior containers) weather-resistant grades of fiberboard and paperboard are permitted under level B. Domestic type or grade (non-weather resistant) fiberboard and paperboard are not acceptable under level B packing. Level B packing as defined in 6.5.1.2(b) covers shipments worldwide by all types of transportation.

6.5.1.3 Level C. This packaging provides minimum protection. It is needed to protect material under known favorable conditions. The following criteria determines the requirements for this degree of protection:

(a) Use or consumption of the item at the first destination.
(b) Shock, vibration, and static loading during the limited transportation cycle.
(c) Favorable warehouse environment for a maximum of 18 months.

(d) Effects of environmental exposure during shipment and intransit delays.
(e) Stacking and supporting superimposed loads during shipment and temporary storage.

6.5.1.4 Commercial. Although not specifically defined by any Government regulation or instruction, commercial packaging (preservation and packing) is understood to be those practices by manufacturers and suppliers to protect and identify material and items packaged for retail and wholesale distribution purposes. ASTM D 3951 provides guidance in the application of commercial packaging. It has been determined by joint DoD instructions that commercial (also in some areas addressed as industrial) packaging should only be used or specified when such packaging is known to satisfy the DoD needs. Such use should be determined before a contract for supplies is awarded or within the life cycle of the contract when substantial savings to the Government may result. Commercial (industrial) packaging should not be specified where multiple shipments and handlings are anticipated or desired.

6.5.2 Packaging terms.

6.5.2.1 Commercial packaging. The methods and materials employed by the contractor to satisfy the requirements of the commercial distribution system.

6.5.2.2 Containerization. The use of an article of transport equipment designed to facilitate and optimize the carriage of goods, by one or more modes of transportation, without intermediate handling of the contents.

6.5.2.3 Exterior pack. A container, bundle, or assembly which is sufficient by reason of material, design, and construction to protect material during shipment and storage. This can be the unit pack or a container with any combination of unit or intermediate packs.

6.5.2.4 Intermediate pack. A wrap, box, or bundle which contains two or more unit packs of identical items.

6.5.2.5 Marking. Application of numbers, letters, labels, tags, symbols, or colors for handling or identification during shipment and storage.

6.5.2.6 Military packaging. The materials and methods or procedures, prescribed in Federal/military specifications, standards, drawings, or other authorized documents, which are designed to provide the degree of packaging protection determined necessary to prevent damage and deterioration during world wide distribution of material.

6.5.2.7 Packaging. The processes and procedures used to protect material from deterioration or damage. It includes cleaning, drying, preserving, packing, marking, and unitization.

6.5.2.8 Packing. Assembling of items into a unit, intermediate, or exterior pack with necessary blocking, bracing, cushioning, weatherproofing, reinforcement, and marking.

6.5.2.9 Preservation. Application of protective measures, including cleaning, drying, preservative materials, barrier materials, cushioning, and containers when necessary.

6.5.2.10 Unitization. Assembly of packs of one or more line items of supply into a single load in such a manner that the load can be handled as a unit through the distribution system. Unitization (unitized loads/unit loads) encompasses consolidation in a container, placement on a pallet or load base, or securely binding together.

6.5.2.11 Unit pack. The first tie, wrap, or container applied to a single item or a quantity thereof, or to a group of items of a single stock number, preserved or unpreserved, which constitutes a complete or identifiable package.

6.6 Asbestos. It is the intent of the Government to eliminate the use of asbestos, except in those cases that a suitable alternative material cannot be used to obtain the desired results. In those cases in which components or materials being packaged do contain asbestos predominately in their make-up, such items should be separately packaged as specified in 3.3.3.2.

6.7 Detailed information. Supplemental information on preservation, packaging, and packing may be found in the following documents:

DSAM 4145.2 Vol. I, TM38-230-1, NAVSUP PUB 502, AFP 71-15, MCO P4030.31B, Packaging of Material Preservation (Volume 1) (National Stock Number 0715-010-0290)
DSAM 4145.2 Vol. II, TM38-230-2, NAVSUP PUB 503, Vol. II, AFR 71-16, MCO P4030.21C, Packing of Material-Packing (Volume II) (National Stock Number 0715-010-0280)
DSAM 4145.7, TM38-236, NAVSUP PUB 504, AFP 15-01-3, AFP 71-8, MCO P4030.30B, Preparation of Freight for Air Shipment (National Stock Number 0715-010-0270)
DLAM 4145.3, TM38-250, NAVSUP PUB 505, AFR 71-4, NCO P4030.19D, Preparation of Hazardous Materials for Military Air Shipment (National Stock Number 0715-010-0021)
Military Standardization Handbook, MIL-HDBK-304, Package Cushioning Design
(Copies of the listed documents may be obtained from the Standardization Documents Order Desk, Bldg 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094 or from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

6.8 Subject term (key word) listing.

Hardware valves
Mechanical valves
Marking
Packing
Preservation

6.9 *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.

Custodians:
Army - ME
Navy - SH
Air Force - 69

Review activities:
Army - SM, MI
Navy - SA, YD
DLA - CS
Air Force - 99

User activities:
Navy - MC

Preparing activity:
Navy - SH
(Project PACK-0955)

APPENDIX A

COMMERCIAL PACKAGING

10. SCOPE

10.1 Scope. This appendix covers information that shall be included on the drawings when specified in 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

This section is not applicable to this appendix.

30. DRAWING CONTENTS

30.1 Drawings. Information on the drawings shall include but not be limited to the following:

(a) Method of preservation and applicable specification.
(b) Level of preservation and packing.
(c) Weight; net, tare, and gross.
(d) Dimensions; interior and overall exterior of the container.
(e) Dimensional location of shock mounts, anchoring, blocking, and bracing.
(f) Bill of material listing specification(s), material, type, class, grade, or other data necessary for identification.
(g) Assembly or disassembly instructions, including special tools if required.
(h) Marking, including handling and structural markings, such as "Use no hooks", "Method II", "Center of Gravity", and so forth.

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	2. DOCUMENT DATE (YYMMDD)
	MIL-V-3E	1 NOVEMBER 1994

3. DOCUMENT TITLE

VALVES, FITTINGS, AND FLANGES (EXCEPT FOR SYSTEMS INDICATED HEREIN) PACKAGING OF

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	
[redacted]	[redacted]	
c. ADDRESS (Include Zip Code) [redacted]	d. TELEPHONE (Include Area Code) (1) Commercial [redacted] (2) AUTOVON (If applicable) [redacted]	7. DATE SUBMITTED (YYMMDD) [redacted]

8. PREPARING ACTIVITY

a. NAME COMMANDER SEA 03R42, NAVAL SEA SYSTEMS COMMAND	b. TELEPHONE (Include Area Code) (1) Commercial (703) 602-0347	(2) AUTOVON DSN 332-0347
c. ADDRESS (Include Zip Code) 2531 JEFFERSON DAVIS HWY ARLINGTON, VA 22242-5160	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	