

MIL-M-29179(YD)  
6 November 1978

## MILITARY SPECIFICATION

### MOORING SYSTEM, LIGHTWEIGHT (FOR USE WITH HARBOR FLOATING OIL BARRIER BOOM)

This specification is approved for use by the Naval Facilities Engineering 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 one type and size lightweight mooring system for use with harbor, floating oil barrier boom as specified in MIL-B-28617.

#### 2. APPLICABLE DOCUMENTS

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

#### SPECIFICATIONS

##### FEDERAL

- L-P-1183 - Plastic Molding Material, Acrylonitrile-Butadiene-Styrene (ABS) Rigid.
- RR-C-271 - Chains and Attachments, Welded, Weldless, and Roller Chain.
- TT-P-320 - Pigment, Aluminum; Powder and Paste, for Paint.
- TT-T-291 - Thinner, Paint, Volatile Spirits (Petroleum-Spirits.)
- TT-V-119 - Varnish, Spar, Phenolic-Resin.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer (156), Naval Construction Battalion Center, Port Hueneme, CA 93043, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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MIL-R-17343 - Rope, Nylon.  
MIL-R-24049 - Rope, Polypropylene.  
MIL-B-28617 - Boom, Floating Barrier, Oil and Debris.

STANDARDS

FEDERAL

FED TEST METHOD STD No. 101 - Preservation, Packaging, and  
Packing Materials: Test  
Procedures.

MILITARY

MIL-STD-129 - Marking for Shipment and Storage.

DRAWINGS

NAVSEA Hull Std Drw 803-632566, Mark II, Lightweight Type (LWT)  
Anchor Assembly and Details.

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D2341 - Standard Specification for Rigid Urethane Foam.

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

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

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### 3. REQUIREMENTS

3.1 Description. The mooring system as depicted in Figure 1 shall consist of a 75 pound (lb) anchor, 12 feet of 3/4-inch link chain, 600 feet of 1-1/8 inch diameter nylon rope for mooring line, a spring buoy with a minimum buoyancy of 500 lb, 120 feet of 3/4-inch diameter nylon rope for crown line, a crown buoy with a minimum buoyancy of 100 lb, 15 feet of 1-1/4 inch diameter polypropylene rope for attachment of the spring buoy to the boom bridle, 5 feet of 3/4-inch nylon rope for boom bridle and hardware as specified for system hookup. Additionally, the system shall include a reusable storage container.

3.2 First article. When specified (see 6.2.1), the contractor shall furnish a mooring system for first article inspection and approval (see 4.3 and 6.4).

3.3 Standard commercial product. The components of the mooring system shall, as a minimum, be in accordance with the requirements of this specification and shall be the manufacturer's standard commercial product. Additional or better features which are not specifically prohibited by this specification, but which are a part of the manufacturer's standard commercial product, shall be included in the components of the mooring system being furnished. Standard commercial product is a product which has been sold or is being currently offered for sale on the commercial market through advertisements or manufacturer's catalogs, or brochures, and represents the latest production models.

3.3.1 Drawings. The drawings forming a part of this specification are end product drawings. No deviation from the prescribed dimensions or tolerances is permissible without prior approval of the contracting officer. Where tolerances could cumulatively result in incorrect fits, the contractor shall provide tolerances within those prescribed on the drawings to insure correct fit, assembly, and operation of the system. Any data (e.g., shop drawings, layouts, flow sheets, processing procedures, etc.,) prepared by the contractor or obtained from a vendor to support fabrication and manufacture of the production item shall be made available, upon request, for inspection by the contracting officer or his designated representative.

3.4 Materials. Materials used shall be free from defects which would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended

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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 are allowed under this specification unless otherwise specifically specified.

3.5 Anchor. The anchor shall be a 75 lb lightweight, nonfouling, fluked marine anchor, either fabricated or cast steel, with shackle, suitable for the intended use stated in 6.1. If cast steel is used, the anchor shall conform to NAVSEA Hull Standard Drawing 803-632566.

3.5.1 Anchor shackle. The anchor shackle shall conform to RR-C-271, 3/4-inch diameter, type IV, class 1. The anchor shackle shall be welded or peened to prevent loosening of the screw pin.

3.6 Anchor chain. The anchor chain shall consist of 12 feet of 3/4-inch zinc-coated, welded, steel alloy chain conforming to type I, grade C, class 1 of RR-C-271. Each end of the chain shall be attached to a 3/4-inch swivel (see 3.6.1 and 3.6.2), and shall be provided with either a 3/4-inch shackle (see 3.6.3) or a 3/4-inch connecting link (see 3.6.4) for attachment of the anchor chain to the anchor shackle and to the mooring line.

3.6.1 Anchor chain swivel. The anchor chain swivel shall conform to RR-C-271, type VII.

3.6.2 Anchor chain swivel attachment. The anchor chain swivel shall be attached permanently to the anchor chain by the manufacturer's standard method of attachment. The method of attachment shall provide a rated breaking strength at least equal to the breaking strength of the anchor chain swivels. Three-fourths inch connecting links (see 3.6.4) are acceptable connections. Swivels and attachments shall be zinc coated.

3.6.3 Shackles. Shackles shall be screw pin anchor shackles conforming to RR-C-271, type IV, class 1. Shackles shall be provided with a means to lock wire the screw pin during system operation.

3.6.4 Connecting links. Anchor chain connecting links shall conform to RR-C-271, type II.

3.7 Mooring line. Mooring line shall be 1-1/8 inch diameter nylon rope conforming to MIL-R-17343. The mooring line shall be 600 feet long and shall be furnished with a 1-1/8 inch rope thimble installed on one end (see 3.7.1 and 3.7.1.1). An additional 1-1/8 inch rope thimble (see 3.7.1), shall be provided for the other end for installation by the user upon determination of the required line length. A 3/4-inch shackle (see 3.6.3), shall be provided for attachment of the mooring line to the mooring buoy.

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3.7.1 Thimble. The rope thimbles shall be fabricated of polyurethane tubing, and shall be sized in accordance with Table I for the specified size of rope to which the thimble will be attached. Polyurethane tubing shall have a range of hardness measured on the Shore Durometer "A" scale of 85 to 95.

TABLE I. Rope thimble tubing sizes.

Rope size (inches)	Tube id (inches)	Tube od (inches)
3/4	13/16	1
1-1/8	1-1/4	1-1/2
1-1/4	1-1/2	2

3.7.1.1 Thimble installation. Thimbles shall be installed in a standard marine eye splice of at least four full tucks plus two additional tapered tucks at the end of the splice.

3.8 Crown line. Crown line shall be a 3/4-inch diameter nylon rope conforming to MIL-R-17343. The crown line shall be 120 feet long and shall be furnished with a 3/4-inch rope thimble installed in one end (see 3.7.1 and 3.7.1.1). An additional 3/4-inch rope thimble (see 3.7.1), shall be provided for the other end for installation by the user upon determination of the required line length. A 1/2-inch shackle (see 3.6.3), shall be provided for attachment of the crown line to the crown buoy. A 1/2-inch shackle (see 3.6.4), shall be provided for attachment of the crown line to the anchor retrieval lug.

3.9 Boom connection line. Boom connection line shall be a 1-1/4 inch diameter polypropylene rope conforming to MIL-R-24049, type I. The boom connection line shall be 15 feet finished length and shall be provided with a 1-1/4 inch rope thimble installed on each end (see 3.7.1 and 3.7.1.1). A 3/4-inch shackle (see 3.6.3), shall be provided for attachment of the boom connection line to the mooring buoy. A 3/4-inch swivel (see 3.6.1), shall be attached to the other end of the boom connection line (see 3.9.1).

3.9.1 Swivel attachment. A 3/4-inch swivel shall be permanently attached to the boom connection line by the manufacturer's standard method of attachment. The method of attachment shall provide a rated breaking strength at least equal to the breaking strength of the swivel. Connecting links (see 3.6.4), are an acceptable type connection.

3.10 Boom anchor bridle. Boom anchor bridle shall be a 3/4-inch diameter nylon rope conforming to MIL-R-17343. The boom anchor bridle shall be 5 feet finished length and shall be provided with a 3/4-inch rope thimble installed on each end (see 3.7.1 and 3.7.1.1). A 1/2-inch

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shackle (see 3.6.3), shall be provided for each end of the line. The boom anchor bridle shall be threaded through one eye of the boom connection line swivel prior to installation of the thimbles.

3.11 Mooring buoy. The mooring buoy shall be of sufficient size to support 500 lb in fresh water while not submerging more than one-half of its length when tested as described in 4.6.2. The maximum nominal volume of the buoy shall not exceed that of a cylinder of 36 inches diameter and 36-inch length. The buoy shall be constructed in accordance with 3.13, and shall have a tension rod diameter of at least 1.5 inch. Maximum buoy weight shall not exceed 80 lb.

3.12 Crown buoy. The crown buoy shall be of sufficient size to support 100 lb in fresh water while not submerging more than one-half of its length when tested as described in 4.6.2. The maximum nominal volume of the buoy shall not exceed that of a cylinder of 24 inches diameter and 24-inch length. The buoy shall be constructed in accordance with 3.13, and shall have a tension rod diameter of at least 1.0 inch. Maximum buoy weight shall not exceed 50 lb.

3.13 Buoy construction. The buoy shall be a plastic shell, of single piece construction, with a plastic foam interior. The buoy shall be fitted with a steel tension rod bonded at both ends to the shell and running along the entire length of the vertical axis of the buoy. A retrieving eye, having a 6-inch interior nominal diameter if circular; or a 6-inch nominal diagonal if square, shall be attached to the upper end of the rod. The following shall be attached to the lower end of the rod:

- (a) Mooring buoy: a 4-inch inside diameter forged steel ring of 1-inch diameter stock connected to the swivel on the buoy by a 5/8-inch screw pin anchor shackle, pin to be peened or welded (see 3.6.3).
- (b) Crown buoy: A swivel eye having a 1.5-inch interior nominal diameter.

The tension rod and all connected swivels, rings, eyes, and shackles shall be zinc coated.

3.13.1 Shell. The shell shall be at least 0.1-inch thick, rotary molded acrylonitrile-butadiene-styrene (ABS) conforming to L-P-1183, type VI, ultraviolet inhibited. At the option of the contractor, a plastic material equal to ABS may be substituted, provided the material is ultra-violet inhibited and passes the test of 4.6 with an impact strength equal to L-P-1183, type VI at 74° Fahrenheit. Shell color shall be orange.

3.13.2 Foam interior. The buoy shall have a rigid, closed cell, self-extinguishing urethane foam interior conforming to ASTM D2341, type 300700000000.

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3.14 System shipping and storage container. Shipping and storage containers shall be designed to retard structural deterioration which would normally occur when exposed continuously to salt water/dockside environment for 10 years on both the inside and outside of the containers. The containers shall not permit the entrance of water when exposed to heavy rains driven by 50 mile per hour winds. The containers shall be of unjointed sheath construction. The containers shall allow for drainage of accumulated moisture and ventilation for expanded air. The containers shall be designed to facilitate ease in loading and unloading contents. The containers shall be provided with a positive means of closure for shipping and storage which can be opened in a timely manner during deployment without requiring special tools. Mooring line and crown line shall be coiled and stored to facilitate manual deployment and recovery. If reel mounted, the reels shall be supported in the container to permit deployment and recovery from the stored position. The containers shall provide for securing of the contents to prevent excessive movement during shipping and when tested in accordance with 4.6.4.

3.14.1 Handling requirements. The container shall be provided with:

- (a) Four-way fork lifting capability.
- (b) Skid mounted on lifting pallet/platform.
- (c) Four steel lifting bars with curved angle at top for sling lifting. Lifting bars shall support the entire weight of the loaded container without permanent deformation.

3.14.2 Container strength. The container shall be designed to conform with the following strength requirements.

3.14.2.1 Cornerwise impact strength. The container, when fully assembled and containing the mooring system shall resist, without structural damage, loads created when the container is dropped on each of its four base corners (see 4.6.4.2).

3.14.2.2 Static strength. The container shall support, without damage, a top load equal to two like containers, each filled with a mooring system packed for shipment.

3.14.2.3 Impact strength. The container, when fully loaded for shipment shall resist, without structural damage, impact loads applied to each side and end in accordance with 4.6.4.4.

3.14.2.4 Dent resistance. The container, when fully loaded for shipment, shall resist damage to container walls when tested in accordance with 4.6.4.5.



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3.14.2.5 Lifting strength. The container, when fully loaded for shipment, shall resist without structural damage, repeated lifting by either slings connected to the container lifting bars or fork lift from all four sides of the container base without deterioration of structural strength or visible deformation.

3.15 Marking. All marking shall be in accordance with MIL-STD-129.

3.15.1 Container markings. Removable panels shall be provided with lineup marks or other positive means to insure that such panels will be replaced in the manner in which they were designed to fit. One end and one vertical side shall be marked with the following information in 1-inch letters:

- (a) Lightweight mooring system.
- (b) Contents:
  - 1 - 75-lb lightweight anchor.
  - 1 - 500-lb buoyancy mooring buoy.
  - 1 - 100-lb buoyancy crown buoy.
  - 1 - 600-foot mooring line.
  - 1 - 120-foot crown line.
  - 1 - 12-foot anchor chain.
  - 1 - 15-foot buoy connection line.
  - 1 - 5-foot boom bridle.
  - System connectors.

(c) This side up ↑

3.16 Technical publications. The contractor shall provide technical publication(s) conforming to the Data Item Description(s) (DID) (DD Form 1664) listed on the Contract Data Requirements List (CDRL) (DD Form 1423) (see 6.2.1 and 6.3). The technical publication(s) should include the following information: Correct deployment/retrieval procedures, storage and breakout procedures, maintenance recommendations, and instructions on rationale for determining proper line length for varying water depths and instructions for adjusting line length and remaking fittings as required.

3.17 Cleaning, treatment, and painting. Surfaces painted in good commercial practice shall be cleaned, treated, and painted as specified herein. Metal surfaces, not painted, which are exposed to the atmosphere or are otherwise subject to a salt-water corrosive environment shall be protected by an integral corrosion-inhibitive coating or shall be of a salt-water corrosion-resistant alloy.

3.17.1 Cleaning. Metal surfaces to be painted shall be cleaned to insure that they are free from all oil, grease, welding slag and spatter, mill scale which can be removed by power wire brushing, products of corrosion, dirt, or foreign substances. Wood surfaces to be painted shall



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be smooth, dry, thoroughly cleaned, and free from any substance that would detract from the ability of the coating system to adhere to the surface.

### 3.17.2 Treatment.

3.17.2.1 Metal. As soon as practicable after cleaning, and before any evidence of rust or other contamination can result, metal surfaces shall be treated with a primer pretreatment coating to increase the adhesion of the coating system.

3.17.2.2 Wood. All wood required in the shipping storage containers shall be treated on both sides as follows: (1) Apply two coats of varnish specified in TT-V-119, cut one-to-one with thinner specified in TT-T-291, type II, grade A; (2) this shall be followed by an application of one coat of uncut varnish specified in TT-V-119; and (3) this shall be followed by an application of one coat of varnish specified in TT-V-119 mixed with aluminum pigment specified in TT-P-320, type II, class 2, at the ratio of 2 lb of paste to 1 gallon of varnish.

### 3.17.3 Painting.

3.17.3.1 Metal. For metal surfaces, painting shall consist of at least one coat of rust-inhibiting primer and one coat of finish enamel. The rust-inhibiting primer shall be applied to a clean, dry surface as soon as practicable after cleaning and treating. Painting shall be with manufacturer's current materials according to manufacturer's current processes except that the total dry film thickness shall be not less than 2.5 mils. The paint shall be free from runs, sags, orange peel, or other defects. Color shall be light gray.

3.17.3.2 Wood. Treating of all wood required in this specification as specified in 3.17.2.2 shall preclude painting of the wood.

### 3.18 Workmanship.

3.18.1 Steel fabrication. The steel used in the fabrication of equipment shall be free from kinks. Material shall be straightened by methods that will not cause injury to the metal. Shearing and chipping shall be done neatly and accurately. Flame cutting, with use of a tip suitable for the thickness of metal, may be employed instead of shearing or sawing, provided that exposed edges are smoothly made. All bends of a major character shall be made with controlled means to insure uniformity of size and shape. Precautions shall be taken to avoid overheating and heated metal shall be allowed to cool slowly.

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3.18.2 Bolted and riveted connections. Holes shall be accurately punched and reamed or drilled and shall have the burrs removed. Washers or lock washers shall be provided for bolts in accordance with good commercial practice, and all bolts, nuts, and screws shall be tight. Rivet heads shall be of uniform shape and in full contact with the surface of the member.

3.18.3 Welding. The surfaces of parts to be welded shall be free from oxide, scale, paint, grease, or other foreign matter. Welds shall be continuous and sound, smooth, and free from porosity, cracks, incomplete fusion, or deformation of materials. All scale or flux deposits (when flux is used) shall be removed from the finished welds. Weld penetration shall provide transference of maximum design stress through the base metal juncture. Fillets shall be provided, where necessary, to reduce stress concentration. Welding and welding inspection shall be in accordance with a welding code acceptable to the activity concerned.

3.18.4 Castings. All castings shall be sound and free from patching, misplaced coring, warping, or any other defect which reduces the castings ability to perform its intended function.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Certificate of compliance. Where certificates of compliance are submitted, the Government reserves the right to check test such items to determine the validity of the certification.

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 inspection. First article inspection shall be performed on one mooring system when a first article sample is required (see 3.2 and 6.2.1). This inspection shall include the examination of 4.5 and the tests of 4.6. The first article may be a standard production

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item from the contractor's current inventory provided the mooring system meets the requirements of this specification and is representative of the design, construction, and manufacturing technique applicable to the remaining mooring systems to be furnished under the contract.

4.4 Quality conformance inspection. Quality conformance inspection shall be performed on each mooring system. This inspection shall include the examination of 4.5.

4.4.1 Certification. The contractor shall furnish a certificate of compliance certifying that the anchor, anchor shackle, shackles, chain, connecting links, swivels, and rope conform to the specified requirements in 3.5 through 3.10.

4.5 Examination. Each mooring system shall be examined for compliance with the requirements specified in this specification. Any redesign or modification of the contractor's standard product to comply with specified requirements, or any necessary redesign or modification following failure to meet specified requirements shall receive particular attention for adequacy and suitability. This element of inspection shall encompass all visual examinations and dimensional measurements. Noncompliance with any specified requirements or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

#### 4.6 Tests.

4.6.1 Assembly, deployment, and retrieval test. Utilizing the information provided in the technical publications (see 3.16 and 6.3), the first article mooring system shall be made up into the proper line lengths for the water depth of the test site. The made up system shall be restowed in the shipping and storage container. The container shall be placed on an appropriate waterborne launching surface and transported to the in-water launching site. Two men shall hook up the system and deploy it manually from the shipping and storage container on the launching surface. The line shall pay out from the stowed position with no kinking or binding. A complete hook up of the system shall be effected to insure component compatibility. System shall be retrieved and restowed with no kinking or binding. Complete deployment and retrieval should be effected by two men in 1 hour. Failure to comply with the test shall constitute cause for rejection.

4.6.2 Buoyancy test. Buoy shall be placed in a container filled with fresh water of depth at least equal to the length of the total test assemblage, which is to be attached to the swivel eye or ring, as applicable. The test weight apparatus shall have a total air weight equal to the sum of the rated buoyancy plus the weight of the water displaced by the test apparatus.

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4.6.3 Tension rod assembly. Apparatus of 4.6.2 shall be used. Weight to be attached to buoy shall be 1.5 times the rated capacity of the buoy. Failure of the rod or as applicable, swivel eye or ring and shackle assembly to stay attached to the buoy shall be cause for rejection. Buoy, with weight attached, shall be lifted from the water by the retrieving eye. Failure of the retrieving eye or rod to stay attached to the buoy shall be cause for rejection.

4.6.4 System storage container test. As a minimum, the following tests of the storage container shall be conducted to insure compliance with the requirements of 3.14.

4.6.4.1 Visual inspection. A visual inspection shall determine compliance with the following requirements:

- (a) Four-way fork lifting capability.
- (b) Skid mounting to protect container and support contained load.
- (c) Securing of lifting bars to container structure.
- (d) Air ventilation portals.
- (e) Unjointed container sheath construction.
- (f) Water and light tightness of corner and lid joints.
- (g) Water drainage outlets.
- (h) Determine adequate capacity for storage of all system components specified in 3.1.
- (i) Inspection of securing method for restraining motion of container contents.

4.6.4.2 Cornerwise-drop test. Each first article container, when loaded to its capacity, shall be subjected to a cornerwise-drop test, in accordance with test method 5005 of FED TEST METHOD STD. No. 101. The prescribed height of drop shall follow the published schedule in the test method based on total weight of the filled container. Relaxation of structural rigidity, excessive variation of joint spacing, or misalignment of movable panels shall constitute failure of this test.

4.6.4.3 Static strength test. To determine static strength of each container, two like containers loaded to capacity, or an equivalent weight providing the same pounds per square foot stress over an equal surface area shall be placed atop the test container by fork lift. After 60 minutes, the test container shall be inspected to determine the integrity of all joints and seams. Relaxation of structural rigidity, excessive variation of joint spacing, permanent warp of frame, or misalignment of movable panels shall constitute failure of this test.

4.6.4.4 Impact strength test. To determine impact strength of each container, the first article shall be tested in accordance with test method 5012, Pendulum Impact Test, of FED TEST METHOD STD. No. 101. Upon

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completion of test, the test container shall be inspected to determine the integrity of all joints and seams. Relaxation of structural rigidity, excessive variation of joint spacing, goring of side panels, or misalignment of movable panels shall constitute failure of this test.

4.6.4.5 Dent resistance test. To determine dent resistance of each container, the first article container and contents shall be tested in accordance with test method 5006, Dent Resistance, of Fed. Test Method Std. No. 101. Upon completion of the test, the test container shall be inspected to determine structural integrity. Breaking, cracking, or penetration of container walls or damage to contents as a result of this test shall constitute failure of the test.

4.6.4.6 Fork lift test. Each first article container, when loaded to its capacity, shall be fork lifted in accordance with 6.2 of test method 5011, Mechanical Handling Test, of FED TEST METHOD STD. No. 101, and then inspected to determine the integrity of all joints and seams. Relaxation of structural rigidity, excessive variation of joint spacing, excessive damage to lifting pallet, loosening of lifting brackets, bending of structural members, or misalignment of movable panels shall constitute failure of this test.

4.6.4.7 Sling hoist test. To determine compliance with hoisting by sling requirements, the first article shall be hoisted by sling in accordance with 6.3 of test method 5011, Mechanical Handling Test, of FED TEST METHOD STD No. 101, and then inspected to determine the integrity of all joints and seams. Relaxation of structural rigidity, excessive variation of joint spacing, excessive damage or loosening of hoisting bars or the mounts, bending of structural members, or misalignment of movable panels shall constitute failure of this test.

4.6.4.8 Restraint inspection. Upon completion of testing specified in 4.6.4.1 through 4.6.4.7, the securing method utilized shall be inspected to determine if an acceptable level of restraint to prevent content motion and abrasion has been achieved.

4.6.4.9 Leak test. After being subjected to tests specified in 4.6.4.1 through 4.6.4.7, the test containers shall be tested in accordance with 1.3(b) of test method 5009, Leaks in Containers, of FED TEST METHOD STD. No. 101. The presence of any leaks or water in the container shall constitute failure of the test.

4.7 Packaging inspection. The packing and marking of the mooring system shall be inspected to verify conformance to the requirements of Section 5.

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## 5. PACKAGING

5.1 Packing. The components of the mooring system shall be packed in the shipping and storage container and blocked, braced, or otherwise secured to prevent movement and damage.

5.2 Marking. The shipping and storage container shall be marked in accordance with MIL-STD-129.

## 6. NOTES

6.1 Intended use. The mooring system covered by this specification is to be used with harbor floating oil barrier boom as specified in MIL-B-28617. The system is intended for use in water depths of less than 100 feet, on sandy bottoms in low current (1-knot maximum) and low wind (25-knots maximum) conditions. For boom mooring where conditions exceed those listed, larger mooring components may be required or additional systems as described herein may be used at more frequent intervals.

6.2 Ordering data. Procurement documents should specify:

### 6.2.1 Procurement requirements:

- (a) Title, number, and date of this specification.
- (b) When a first article sample is required for inspection and approval (see 3.2, 4.3, and 6.4).
- (c) Number of technical publications required (see 3.16 and 6.3).

6.3 Data requirements. When this specification is used in a procurement which incorporates a DD Form 1423 and invokes the provisions of paragraph 7-104.9(n) of the Armed Services Procurement Regulations (ASPR), the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the Contract Data Requirements List (DD Form 1423) incorporated into the contract. When the provisions of ASPR 7-104.9(n) are not invoked, the data specified below shall be delivered in accordance with the contract requirements. Deliverable data required by this specification is cited in the following paragraphs:

<u>Paragraph</u>	<u>Data requirements</u>	<u>Applicable DD 1664</u>
3.16	Publications, Commercial	DI-M-24010A
4.4.1	Certificate of Compliance	DI-E-2121

(Copies of the Data Item Descriptions required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

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6.4 First article. When a first article is required, it shall be tested and approved under the appropriate provisions of paragraph 7-104.55 of the ASPR. The first article should be a preproduction sample or it may be a standard production item from the contractor's current inventory as specified in 4.3. The first article should consist of one mooring system. The contracting officer should include specific instructions in all procurement instruments, regarding arrangements for examinations, tests, and approval of the first article.

Preparing activity:

Navy - YD

Project No. 2040-N136



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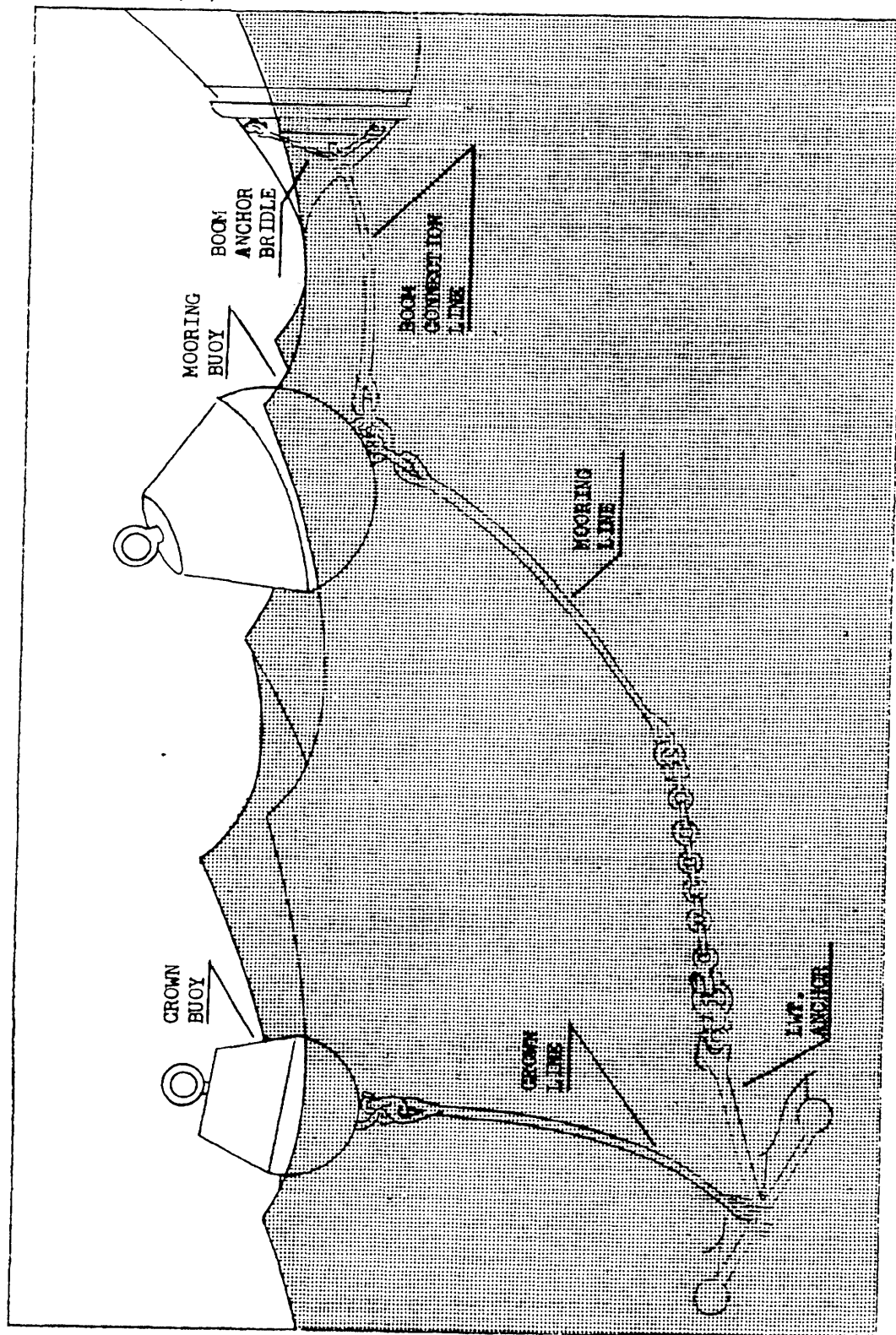


FIGURE 1. Typical operating scenario.

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL	
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<p>DOCUMENT IDENTIFIER (Number) AND TITLE      MOORING SYSTEM, LIGHTWEIGHT (FOR USE WITH  MIL-M-29179(YD) -      HARBOR FLOATING OIL BARRIER BOOM)</p>	
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