

| METRIC |

MIL-B-29163B(YD)
21 March 1991
 SUPERSEDING
 MIL-B-29163A(YD)
 10 April 1981

**MILITARY SPECIFICATION
 BUOYS, MARKER (METRIC)**

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 marker buoys that are used with and without mooring (see 6.1).

1.2 Classification. Marker buoys shall be of the following sizes and shapes as specified (see 6.2). At the contractors request two size 1 buoys may be linked and used instead of a size 2 buoy (see 3.8.2, and 6.2).

Size 1 - Small, 19-kilogram (kg) buoyancy, 10-kg maximum weight.
 Size 2 - Large, 45-kg buoyancy, 19-kg maximum weight.

Shape A - Peanut shaped marker buoy.
 Shape B - Barrel (or cylinder) shaped marker buoy.
 Shape C - Mooring shaped marker buoy.

See Figure 1 at the end of this specification for a drawing of the buoy shapes.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer (Code 156), Naval Construction Battalion Center, Port Hueneme, CA 93043-5000, 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 2050

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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

- L-P-1183 - Plastic Molding Material, Acrylonitrile Butadiene Styrene (ABS) Rigid.
- PPP-B-601 - Boxes, Wood, Cleated Plywood.
- PPP-B-621 - Boxes, Wood, Nailed and Lock Corner.

STANDARDS

MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.

(Unless otherwise indicated, copies of federal and military specifications, storage, and handbooks are available from the Naval Publication & Printing, Service Office, Bldg. 40, NPM DODSSP, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

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 which are current on the date of the solicitation (see 6.2).

ASTM

ASTM - 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.)

(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 Physical characteristics. The buoys shall have an interior and an exterior. All buoys shall be fitted with a tension rod with a retrieving eye on the upper end and a swivel eye for a pendant attachment on the opposite end.

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3.1.1 Interior foam. The interior foam shall have a uniform center of gravity and shall be a closed cell foam which can be rigid or flexible and energy absorbing depending on the buoy design. When the foam is rigid, the foam interior shall conform to ASTM D2341, type 300780000000. Alternate foam may be provided if it has properties equivalent to those specified for the urethane foam. When the foam is flexible and energy absorbing, the foam shall have alternating layers of different thickness which are heat welded to each other. In either case the interior foam of the buoy shall make up the bulk of the buoy mass.

3.1.2 Exterior surface. The exterior surface shall be either a shell which protects the interior foam or a denser version of the interior foam. When the exterior surface is a shell, the shell shall be at least 1/10" thick acrylonitrile butadiene styrene (ABS) conforming to L-P-1183, type VI, ultraviolet inhibited. At the option of the contractor, a plastic material of equivalent properties may be substituted provided the material is at least 1/10" thick, an ultraviolet inhibited grade, and the assembled buoy meets the requirements of this specification. When the exterior surface is a denser version of the interior foam, end caps shall be heat sealed to the buoy so that the buoy sheds water. In either case the exterior surface shall inhibit marine fouling. When specified (see 6.2), an epoxy antifoulant shall be added to the exterior surface for extended marine use.

3.2 First article. When specified (see 6.2), the contractor shall furnish a buoy for first article inspection and approval (see 4.3 and 6.3).

3.3 Standard commercial product. The marker buoys 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 marker buoy being furnished. A 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 model.

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 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. Unless otherwise specified, none of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification.

3.4.1 Interior foam and exterior surface. The interior foam and the exterior surface shall function indefinitely in the ocean environment and shall have a high degree of fade and sunburn resistance. When specified (see 6.2), proof of prior marine use of the buoy materials shall be required.

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3.5 Interchangeability. All units of the same classification furnished with similar options under a specific contract shall be identical to the extent necessary to insure interchangeability of component parts, assemblies, accessories, and spare parts.

3.6 Dissimilar metals. Intimate contact between dissimilar metals which can be expected to cause galvanic corrosion shall be avoided. When such contact cannot be avoided, an interposing insulating material shall be provided to minimize the corrosive effect.

3.7 Construction. The buoy(s) shall have a tension rod running along the entire length of the vertical axis of the buoy. A retrieving eye shall be firmly attached to the upper end of the rod and a swivel eye shall be attached to the lower end. The retrieving eye shall have a 153 millimeter (mm) interior nominal diameter if circular, or a 153 mm nominal diagonal if square. The swivel eye shall be 40 mm nominal diameter. The tension rod, eye, and swivel shall be made of steel or have a tensile strength and corrosion resistance equal to, or greater than, hot dipped galvanized steel.

3.8 Performance.

3.8.1 Size 1. The buoy shall be of sufficient size to support 19 kg without being submerged more than one half of its length from top to bottom. The buoy shall weigh no more than 10 kg. The tension rod shall be at least 12.7 mm in diameter.

3.8.2 Size 2. The buoy(s) shall be of sufficient size to support 45 kg without being submerged more than one half of its length from top to bottom. The buoy(s) shall weigh no more than 19 kg. The tension rod shall be at least 19 mm in diameter. If two size 1 buoys are used in combination instead of a size 2 buoy (see 1.2 and 6.2), the same requirements apply.

3.9 Color. The exterior surface of the buoy shall be pigmented and ultraviolet/antioxidant protected. The color shall be of the manufacturer's standard bright orange, unless otherwise specified (see 6.2). The exterior surface shall contain the color pigment and shall be a homogeneous color. A surface coating is unacceptable.

3.10 Workmanship.

3.10.1 Exterior surface. The exterior surface of the buoy shall be free from warpage, cracks, and chipped or blistered surfaces, and shall have a surface with no burrs.

3.10.2 Bolted connections. Bolt holes shall be accurately punched or drilled and shall have the burrs removed. Washers or lockwashers shall be provided in accordance with good commercial practice, and all bolts, nuts and screws shall be tight.

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.

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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 document 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 document shall become a part of the contractor's overall inspection system, or quality program. The absence of any inspection requirements in this document shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements specified herein and in applicable referenced documents.

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

- a. First article inspection (see 4.3.1).
- b. Quality conformance inspection (see 4.3.2).

4.3.1 First article inspection. The first article inspection shall be performed on one buoy when a first article is required (see 3.2 and 6.3). This inspection shall include the examination of 4.5 and the tests of 4.6. The first article may be either a first production item or a standard production item from the supplier's current inventory provided the item meets the requirements of the specification and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract.

4.3.2 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.5, the tests of 4.6, and the packaging inspection of 4.7. This inspection shall be performed on the samples selected in accordance with 4.4.

4.4 Sampling. Sampling and inspection procedures shall be in accordance with MIL-STD-105. The unit of product shall be one buoy or, if two size 1 buoys are used instead of a size 2 buoy, two buoys. All buoys offered for delivery at one time shall be considered a lot for the purpose of inspection.

4.5 Examination. Each sample selected shall be examined for compliance with the requirements in section 3 of this document. This element of inspection shall encompass all visual examinations and dimensional measurements. Noncompliance with any specified requirement shall constitute one defect.

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4.6 Tests. The first article shall be tested as specified in 4.6.1. Each production unit selected shall be tested as specified in 4.6.1 through 4.6.4. Failure to pass any test shall constitute one defect.

4.6.1 Buoyancy test. The swivel shall be loaded with 19 or 45 kg, as required by the size of buoy(s), and then placed in a tank of water. Submergence of the buoy(s) more than one-half of its length from top to bottom shall be cause for rejection. Failure of the swivel, eye, or rod to stay attached to the buoy(s) shall also be cause for rejection.

4.6.2 Total submergence. The swivel shall be sufficiently loaded to cause total submergence of the buoy(s) in the test tank. The buoy(s) shall be left in this condition for a minimum of 1 hour. Failure of the swivel, eye, or tension rod to stay attached to the buoy, or cracking of the exterior surface anywhere on the buoy(s), shall be cause for rejection.

4.6.3 Drop test. The buoy(s) of each size shall be hoisted to a height of 10 feet (measured between the deck and lowermost point of the buoy(s)), released and allowed to fall freely to the deck. Damage to the exterior surface or fittings in rendering the buoy(s) unusable or reducing their function shall be cause for rejection. This test shall be performed at 70 degrees Fahrenheit plus or minus 5 degrees Fahrenheit.

4.7 Packaging inspection. The packing and marking of the buoy(s) and tension bars shall be inspected to verify conformance to the requirements in Section 5.

5. PACKAGING

5.1 Packing. Packing shall be A, B, or commercial as specified (see 6.2).

5.1.1 Level A. The buoy(s) shall be packed in close-fitting boxes conforming to PPP-B-601, overseas type or PPP-B-621, class 2. The contents shall be cushioned, blocked, and braced to prevent movement.

5.1.2 Level B. The buoy(s) shall be packed as specified for level A, except the boxes shall be domestic type or class 1, as applicable.

5.1.3 Commercial. The buoy(s) shall be packed in a manner which will insure arrival at destination in satisfactory condition. Containers and packing shall conform to the applicable carrier rules and regulations.

5.1.4 Marking. The buoy(s) and shipping containers shall be marked in accordance with MIL-STD-129.

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 marker buoys are intended for use as markers for anchors around pontoon causeways and buoyant fuel lines. When used around pontoon causeways, the marker buoys are used with mooring. When used around buoyant fuel lines, the marker buoys are used without mooring.

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6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in acquisition documents:

6.2.1 Acquisition requirements. Acquisition requirements should 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. Size and shape required (see 1.2).
- d. When two size 1 buoys in combination are requested instead of a size 2 buoy (see 1.2 and 3.8.2).
- e. When epoxy antifoulant shall be added to the exterior surface (see 3.1.2).
- f. When a first article is required for inspection and approval (see 3.2 and 4.3.1).
- g. When proof of prior marine use for buoy materials is required (see 3.4.1).
- h. When the finish color of the exterior surface shall be other than as specified (see 3.9).
- i. Level of packing required (see 5.1).

6.3 First article. When a first article inspection is required, the item will be tested and should be a first article sample or it may be a standard production item from the contractor's current inventory as specified in 4.3.1. The first article should consist of one unit. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article.

6.4 Part or identifying number (PIN). PIN's were developed to identify items covered by this specification for cataloging purposes. The PIN consists of this specification identifier (M29163) and the SPN code number (see 1.2.1). The PIN shall be designated as follows:

PIN designation	M29163	1	A
Specification number	_____	_____	_____
Size	_____	_____	_____
Shape	_____	_____	_____

The above identifies a size 1 (small, 19-kilogram buoyancy, 10-kg maximum weight), shape A (peanut-shaped marker buoy) buoy.

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6.5 Metric conversion tables. The following tables list the English equivalents to the metric quantities specified in the text. Values given in the specification might not be converted literally, but are rounded for convenience and to correspond to the accuracy of available measuring instruments.

Length		Mass	
Metric quantity	English equivalent	Metric quantity	English equivalent
2.5 mm	.1 inch	10 kg	22 lb
12.7 mm	.5 inch	19 kg	42 lb
19 mm	.75 inch	45 kg	100 lb
40 mm	1.5 inch		
153 mm	6 inch		

6.6 Cross-reference of classifications. The following marker buoys were previously classified as indicated.

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Size 1
Size 2

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Size 1
Size 2

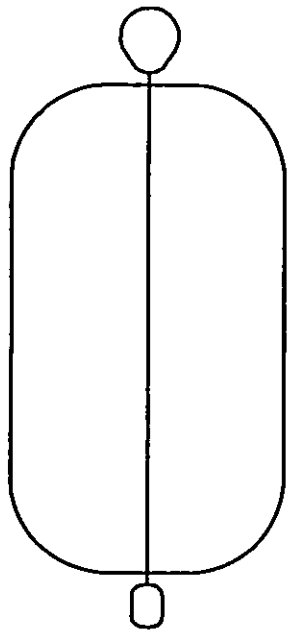
Shape A
Shape B
Shape C

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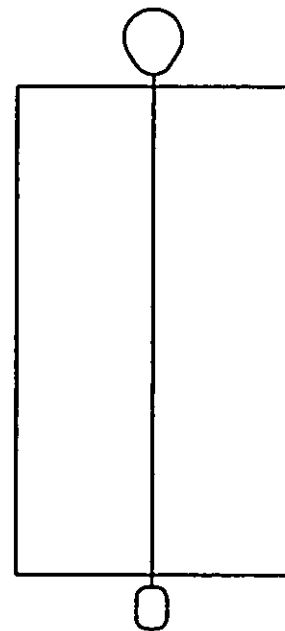
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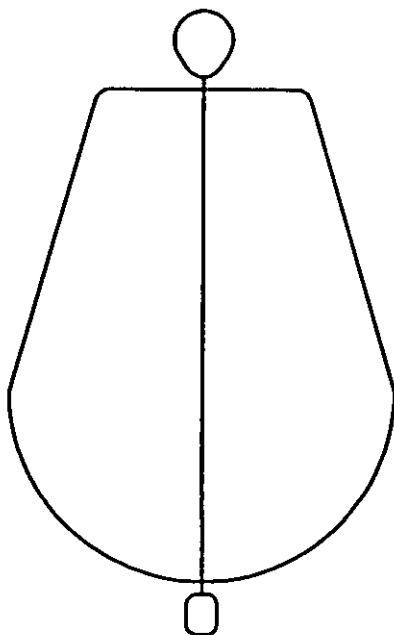
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PEANUT SHAPED



BARREL SHAPED



MOORING SHAPED

FIGURE 1. Marker buoy shapes.

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.

RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-B-29163B(YD)	2. DOCUMENT DATE (YYMMDD) 21 March 1991.
3. DOCUMENT TITLE BUOYS, MARKER (METRIC)		
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)	e. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY		
a. NAME CHRISTOPHER FENAROLI PROJECT MANAGER	b. TELEPHONE (Include Area Code) (1) Commercial (805) 982-5609 (2) AUTOVON 551-5609	
c. ADDRESS (Include Zip Code) COMMANDING OFFICER NAVAL CONSTRUCTION BATTALION CENTER CODE 156 PORT HUENEME, CA 93043-5000	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	