

MIL-B-22700(CG)
3 November 1960

MILITARY SPECIFICATION

BRIDLE, CHAIN, BUOY

1. SCOPE

1.1 Scope, - This specification covers bridles fabricated from chain of the open link pattern, with appropriate center rings, used in attaching Aids to Navigation buoys to their mooring chains.

1.2 Classification, - Bridles shall be of one type, one grade and the following sizes and lengths, as specified (see 6.1):

SIZES	LENGTHS
7/8 inch	10 feet
1 inch	12 feet 15 feet
1-1/4 inch	15 feet 23 feet 25 feet
1-1/2 inch	18 feet 26 feet

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS

Military

MIL-D-16974 - Steel Bars, Billets, Blooms and Slabs, Carbon and Alloy (For reforging or other operations before Heat Treatment).

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

2.2 Other Publications, - The following document forms a part of this specification. Unless otherwise indicated, the issue in effect on date of invitation for the bids shall apply.

FSC 2050

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OFFICIAL CLASSIFICATION COMMITTEE
Uniform Freight Classification Rules

(Application for copies should be addressed to the Official Classification Committee, 1 Park Avenue at 33rd St, New York 16, N. Y.)

3. REQUIREMENTS

3.1 Bridles shall be made of carbon steel of uniform quality capable of being properly welded. The steel shall conform to the physical and chemical requirements of grade 1010 of Specification MIL-S-16974.

3.1.1 Definition.-

3.1.1.1 A bridle is defined as two lengths of common links, both with an end link attached to each end, the two lengths then being connected by a center ring, making one continuous length, as in Figure 1.

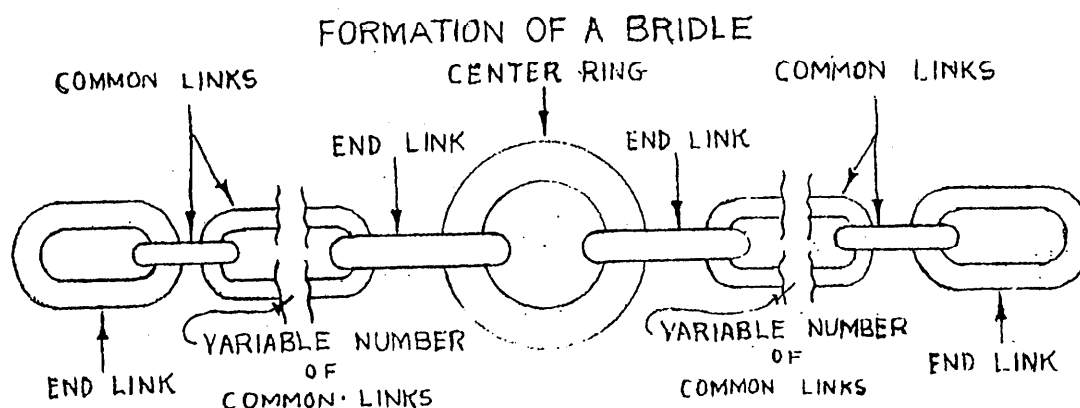


FIGURE 1.

3.1.1.2 Bridle size is defined as the bar diameter in inches of the common links used in the bridles.

3.1.1.3 When not modified by "common" or "end", the term "links" refers throughout to all components of the bridle collectively: the common links, the end links, and the center ring.

3.1.2 The supplier shall furnish an affidavit either from the manufacturer or a reputable engineering laboratory to the effect that the material has been tested and found to be in accordance with the requirements of Specification MIL-S-16974. This affidavit shall also state the size and amount of steel in pounds represented by the tests. A mill physical test shall also be furnished.

3.2 Unless otherwise specified, the common links, end links, and center ring shall be of the shape and proportions shown on Figure 2.

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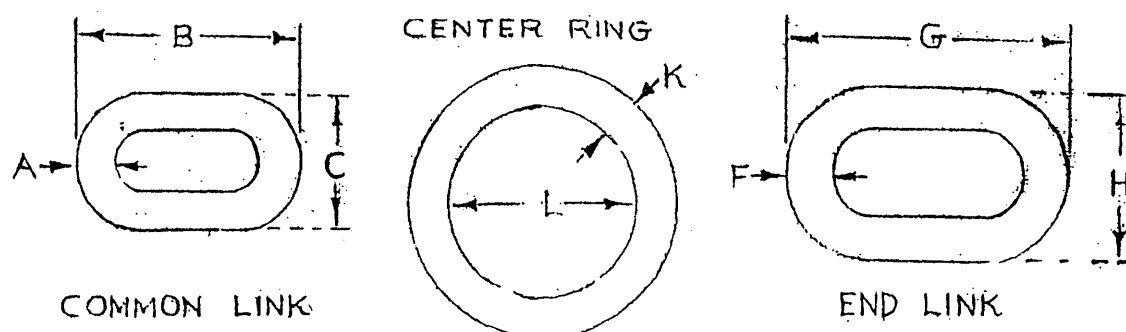


FIGURE 2

3.3 Dimensions.-- The nominal dimensions of links for bridles of various sizes shall be as shown in Figure 2 and Table I. Permissible variations in the diameter of bars in the finished bridles shall be plus $1/32$ " or minus 0". Tolerances for the outside length and width of links and inside diameter of center ring are specified in Table II and III.

TABLE I DIMENSIONS

COMMON LINKS (INCHES)			END LINKS (INCHES)		CENTER RING (INCHES)			NUMBER OF COMMON LINKS	LENGTH IN FEET TOLERANCE $5\% \pm$
A	B	C	F	G	H	K	L		
7/8	5-1/4	3-1/8	1-1/8	6-3/4	3-7/8	1-1/4	6	28	10
1	6	3-1/2	1-1/4	7-1/2	4-3/8	1-3/4	6	28	12
1	6	3-1/2	1-1/4	7-1/2	4-3/8	1-3/4	6	36	15
1-1/4	7-1/2	4-3/8	1-1/2	9	5-1/4	1-3/4	6	28	15
1-1/4	7-1/2	4-3/8	1-1/2	9	5-1/4	1-3/4	6	48	23
1-1/4	7-1/2	4-3/8	1-1/2	9	5-1/4	1-3/4	6	52	25
1-1/2	9	5-1/4	1-7/8	11-1/4	6-1/2	2-1/4	8	28	18
1-1/2	9	5-1/4	1-7/8	11-1/4	6-1/2	2-1/4	8	44	26

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TABLE II
COMMON AND END LINK TOLERANCES (INCHES)

WITH A NOMINAL BAR DIAMETER OF	OUTSIDE LENGTH AND WIDTH TOLERANCE IS + -
1/2 to 11/16	1/32
3/4 to 15/16	1/16
1 to 1-3/16	3/32
1-1/4 to 1-7/16	1/8
1-1/2 to 1-11/16	5/32
1-3/4 to 1-15/16	3/16

TABLE III
RING TOLERANCES (INCHES)

WITH A BAR DIAMETER OF	INSIDE DIAMETER TOLERANCE IS + -
1-1/4	1/8
1-3/4	3/16
2-1/4	9/32

3.4 Welding.— Welding shall be performed by an electric welding method approved by the bureau or agency concerned, or other process also approved by the bureau or agency concerned. The diameter of the weld shall not exceed the diameter of the bar by more than 25 percent.

3.5 Weight.— The nominal weight for each size of bridle shall be as shown on Table IV. The weights shall not vary more than 4 percent over or under the nominal weights specified.

TABLE IV BRIDLE WEIGHTS

SIZE	7/8	1		1-1/4			1-1/2	
LENGTH (FEET)	10	12	15	15	23	25	18	26
WEIGHT PER BRIDLE	70	120	135	215	305	345	400	555

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3.6 Finish.— Unless otherwise specified in the order or contract, the bridles shall be submitted in natural color and finish. The use of varnishes or other coatings is prohibited.

3.7 Surface.— Each link shall be free from burrs, excessive overlap, and flaws or defects including rough surfaces which might cause kinking of the bridle in service.

3.8 Breaking load.— When tested as specified in 4.4.4 the chain shall be capable of withstanding the applicable breaking load specified in Table V.

3.9 Proof load.— When tested as specified in 4.4.6 the bridles shall withstand the proof load specified in Table V without fracture, tendency to open at the weld, stretching beyond the tolerance shown in Table II, or revealing any other defect which might effect the serviceability of the bridles.

TABLE V PHYSICAL TEST VALUES

SIZE	PROOF LOAD (pounds)	BREAKING LOAD (pounds)
7/8	22,000	44,000
1	29,000	58,000
1-1/4	45,500	91,000
1-1/2	65,500	131,000

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3.10 Marking.- One terminal end link on each bridle shall be legibly and permanently stamped with the manufacturer's trade-mark or name, and the month and year of manufacture.

3.11 Workmanship.- Workmanship shall be first class in every particular. The surface of all links shall be smooth, of the required form and proportions, and free from visible defects.

4. QUALITY ASSURANCE PROVISIONS

4.1 Unless otherwise specified in the contract or order all bridles shall be inspected and tested at the place of manufacture. The preparation of test specimens and the handling of material necessary for testing and inspection shall be arranged by the contractor at his expense. Inspection records of the examinations and tests shall be kept complete and available to the Government (see 3.1.2). Acceptance by the Government inspector shall be provisional subject to final acceptance by the contracting officer.

4.2 Lot.- A lot shall consist of all bridles of the same size and from the same melt of steel, submitted for inspection at the same time.

4.3 Visual and dimensional examination.- One bridle out of each ten or less in each lot shall be selected and examined by the Government inspector to determine conformance with this specification regarding dimensions, quality of welds, weight, finish, surface, and other requirements not involving tests.

4.3.1 Rejections.- Any lot from which a bridle does not conform to the requirements specified in 4.3 shall be rejected. Rejected chain may be resubmitted for examination after the manufacturer has removed the deficiency causing rejections.

4.4 Tests.- Acceptance tests shall be made in the presence of the Government inspector.

4.4.1 Order of tests.- Breaking and elongation tests shall be conducted prior to the proof test.

4.4.2 Method of tests.- Samples for breaking and elongation tests and lengths for proof testing shall be tested by suitably securing them in a testing machine approved by the agency concerned in such manner that the samples shall be free from twist. The holding arrangement shall be such that all stresses bearing on the terminal links of the section under test are the same as those applied to every link tested.

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4.4.3 Sampling for breaking and elongation tests.- A sample for the breaking and elongation tests shall consist of a section of common links cut from a bridle of a lot which has met the requirements of 4.3. The sample shall be measured to determine its gage length for the elongation test. If the sample fails the breaking and elongation tests, two additional specimens shall be selected at random and subjected to the same tests. Failure of the two additional specimens to pass the breaking and elongation tests shall be cause for the rejection of the entire lot.

4.4.4 Breaking test.- The sample shall be subjected to the breaking loads specified in Table IV to determine compliance with 3.8. The chain will be considered to have passed the breaking test if the sample withstands the specified load for 15 seconds, or if it breaks at a load greater than that specified in Table V.

4.4.5 Elongation test.- The remains of the satisfactory breaking test sample shall be measured for length to determine the amount of elongation. The elongation shall be not less than 15 percent.

4.4.6 Proof test.- All bridles in each lot shall be proof-tested for compliance with 3.9. After the proof test, the bridles shall be thoroughly inspected and any links showing cold welding, surface rupture, deformation, inferior workmanship, or other defects, shall be replaced and the bridles again subjected to the proof test. If the total number of defective links requiring replacement exceeds 5 percent, the lot shall be rejected.

4.4.6.1 Length.- After proof-testing, all bridles shall be measured for length in accordance with Table I. The bridles shall be measured to the end of the terminal end links. In determining the length of the bridle, a load not to exceed 10 percent of the proof load shall be applied to take up the slack. The measurement shall not vary plus or minus more than 5 percent of the length specified. Any bridle failing to conform to the length requirements shall be rejected.

5. PREPARATION FOR DELIVERY

5.1 Packaging and packing.- Bridles shall be bundled with wire or bundling chain of sufficient size and strength to insure safe handling and delivery. Bundling chain, as used, shall become the property of the Government. The maximum number of bridles per bundle shall be as follows:

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<u>SIZE</u>	<u>LENGTH (FEET)</u>	<u>BRIDLES PER BUNDLE</u>
7/8	10	10
1	12	10
	15	10
1-1/4	15	8
	23	6
	25	6
1-1/2	18	5
	26	4

Unless otherwise specified bridles shall be loaded for shipment in conformance with Uniform Freight Classification Rules (see 6.1).

5.2 Marking.-- Each bundle of bridles shall be tagged with metal or water-proofed shipping tags indicating complete name and address of Consignee, Contract and contract item number, lot number, quantity contained and size, name of the manufacturer and Federal stock number (see 6.1).

6. NOTES

6.1 Ordering data.-- Procurement documents should specify the following:

- (a) Title, number and date of this specification.
- (b) Size and length required (see 1.2).
- (c) Quantity required.
- (d) Any special marking required other than that specified (see 3.10 and 5.2).
- (e) Special shipment requirements other than that specified (see 5.1).
- (f) Stock numbers.

Notice.-- When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

Preparing Activity:
U. S. Coast Guard