

8 May 1973
SUPERSEDING
MIL-B-2481D(GL)
5 April 1967

MILITARY SPECIFICATION

BULL'S EYES, RIGGING, 5/16 INCH INSIDE DIAMETER

1. SCOPE

- * 1.1 Scope. This specification covers bull's eyes used for rigging with 5/16-inch diameter rope.

1.2 Classification. Bull's eyes shall be of the following types as specified (see 6.2):

- Type I - Magnesium.
Type II - Wood, wire strapped.

2. APPLICABLE DOCUMENTS

- * 2.1 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

- | | |
|-----------|--|
| QQ-M-55 | - Magnesium Alloy, Permanent and Semi-Permanent Mold Castings. |
| QQ-M-56 | - Magnesium Alloy, Sand Castings. |
| QQ-W-461 | - Wire, Steel, Carbon, (Round, Bare and Coated). |
| QQ-Z-325 | - Zinc Coating, Electrodeposited, Requirement For. |
| TT-E-529 | - Enamel, Alkyd, Semi-Gloss. |
| TT-P-1757 | - Primer Coating, Zinc Chromate, Low-Moisture-Sensitivity. |

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- PPP-B-566 - Boxes, Folding, Paperboard.
- PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner.
- PPP-B-636 - Boxes, Shipping, Fiberboard.
- * PPP-B-665 - Boxes: Paperboard, Metal Edged and Components.
- PPP-B-676 - Boxes, Setup.

MILITARY

- MIL-M-3171 - Magnesium Alloy, Processes for Pretreatment and Prevention of Corrosion on.
- MIL-L-10547 - Liners, Case, and Sheet, Overwrap; Water-Vapor-proof or Waterproof, Flexible.

STANDARDS

MILITARY

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

DRAWING

ARMY NATICK LABORATORIES

- 4-1-106 - Bull's Eye, Rigging, 5/16-Inch Inside Diameter

(Miniature copy of Drawing 4-1-106, identified as figure 1, is attached for information purposes only.)

(Copies of specifications, standards, drawing and publications required by suppliers 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 documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

American Society for Testing and Materials (ASTM)

ASTM B 94 - Magnesium - Alloy Die Castings

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

National Motor Freight Traffic Association, Inc., Agent

National Motor Freight Classification

(Application for copies should be addressed to the American Trucking Associations, Inc., Tariff Order Section, 1616 P Street, N.W., Washington, DC 20036.)

Uniform Classification Committee, Agent

Uniform Freight Classification

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, Illinois 60606.)

(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.)

3. REQUIREMENTS

- * 3.1 First article. When specified (see 6.2), the supplier shall furnish a sample of the bull's eyes for first article inspection and approval (see 4.3 and 6.3).
- * 3.2 Materials. Materials shall be as specified herein and on the drawing. Materials not definitely specified shall be of the quality normally used by the manufacturer provided the completed bull's eyes comply with all provisions of this specification.
 - * 3.2.1 Magnesium alloy castings. Magnesium alloy castings shall be any one of the following:
 - a. Die casting - Die casting shall conform to AZ91A or AZ91B of ASTM B 94.
 - b. Permanent mold casting - Permanent mold casting shall conform to composition AZ63A, AZ91C or AZ92A, temper T6 of QQ-M-55.
 - c. Sand casting - Sand casting shall conform to alloy AZ63A, AZ91C, or AZ92A, temper T6 of QQ-M-56.
 - 3.2.2 Wood. Wood shall be thoroughly seasoned lignum vitae and shall weigh within the limits of a minimum of 72 pounds and a maximum of 82 pounds per cubic foot at the time of fabrication when tested as specified in 4.4.1.1. The wood shall be free from any knot and split.

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- * 3.2.3 Wire, steel. Steel wire shall conform to composition steel numbers 1006 through 1035, finish 1, temper hard or annealed-in-process of QQ-W-461.
- * 3.2.4 Primer. Primer shall conform to composition G or L, as applicable, color Y of TT-P-1757.
- * 3.2.5 Enamel. Enamel shall conform to class A or B, composition G or L, as applicable, black color No. 27038 of TT-E-529.

3.3 Construction. The construction of the bull's eyes shall conform to the requirements specified herein and as shown on Drawing 4-1-106.

3.3.1 Type I. Type I bull's eye shall be fabricated of any of the three materials specified in 3.2.1. The bull's eye shall be sound, smooth and free from fracture.

3.3.2 Type II. Type II bull's eye shall consist of a body and retainer assembly.

3.3.2.1 Body. The body shall be fabricated of wood specified in 3.2.2. The body shall be smooth.

3.3.2.2 Retainer. The retainer shall be fabricated of materials specified in 3.2.3.

3.3.3 Removal of burrs, sharp edges and rough spots. All burrs, sharp edges and rough spots shall be removed prior to application of finish.

3.4 Finish.

3.4.1 Type I bull's eye.

3.4.1.1 Chemical treatment. All surfaces of type I bull's eyes shall be treated in accordance with type III or IV of MIL-M-3171.

3.4.1.2 Priming. After the chemical treatment specified in 3.4.1.1, the type I bull's eyes shall be coated with primer specified in 3.2.4.

3.4.1.3 Enameling. After drying, all primed surfaces of type I bull's eyes shall be coated with enamel specified in 3.2.5. The coating shall level out to produce a smooth, uniform finish free from any area of thin or no film, sag, run, or drop.

3.4.2 Type II bull's eye.

3.4.2.1 Polishing and varnishing. All surfaces of the body of type II bull's eye, except the retainer groove, shall be polished. After polishing, all surfaces of the body including the retainer groove shall be coated with commercial clear varnish. The coating shall level out to produce a smooth uniform film free from any area of thin or no film, sag, run, or drop.

3.4.2.2 Zinc coating. After forming the retainer of type II bull's eye and prior to assembly to the body, the retainer shall be zinc coated by either of the following methods:

- (a) Electrodeposited zinc coating in accordance with type III, class 2 of QQ-2-325.
- (b) Hot dipped zinc coating and supplementary chemical treatment to make surface acceptable for enameling in accordance with manufacturer's commercial practice.

The zinc coating shall produce an adherent, continuous, uniform film coating free from scratch, dig, dirt or foreign matter imbedded in coating.

3.4.2.3 Enameling. All surfaces of the retainer of type II bull's eye shall then be coated with enamel specified in 3.2.5. The coating shall level out to produce a smooth, uniform finish free from any area of thin or no film, sag, run, or drop.

3.5 Workmanship. The finished bull's eyes shall be clean and free of dirt and grease.

4. QUALITY ASSURANCE PROVISIONS

- * 4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier 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.
- * 4.2 Classification of inspection. The inspection requirements specified herein are classified as follows:
 - (a) First article inspection (see 4.3).
 - (b) Quality conformance inspection (see 4.4).

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* 4.3 First article inspection. When a first article is required, the bull's eyes shall be examined as specified in 4.4.3.1 and 4.4.3.2. The presence of any defect shall be cause for rejection of the first article.

* 4.4 Quality conformance inspection. Except as otherwise specified herein, sampling for inspection shall be performed in accordance with MIL-STD-105.

4.4.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected and tested in accordance with all the requirements of referenced specifications, drawing and standards unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

4.4.1.1 Material testing. In addition to the quality assurance provisions of the subsidiary specifications and drawing, testing shall be performed on material listed in table I for the test characteristics shown. Requirement for weight of wood is applicable to the individual unit. The inspection level shall be S-1 with an acceptable quality level (AQL) of 6.5, expressed in terms of defects per hundred units.

TABLE I. Material test

Material and lot expressed in terms of	Charac-teristic	Require-ment para.	Test method	Number of determinations per sample unit	Results reported as numerically
Wood (25 board feet)	Weight	3.2.2	Commercial	1	To nearest 0.5 pounds per cubic foot

4.4.2 In-process inspection.

* 4.4.2.1 Process examination. Examination shall be made of the following fabrication processes to establish conformance with specified requirements. Whenever nonconformance is noted, correction shall be made to the process and all items processed:

Requirement or operationRequirement reference

(a) Removal of burrs, sharp edges, and rough spots prior to finishing

3.3.3

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<u>Requirement or operation</u>	<u>Requirement reference</u>
(b) Chemical treatment of magnesium surfaces prior to application of primer	3.4.1.1
(c) Priming of chemically treated magnesium surfaces prior to application of enamel	3.4.1.2
(d) Polishing of body (except the retainer groove) of bull's eyes prior to application of varnish	3.4.2.1
(e) Zinc coating of retainer prior to enameling	3.4.2.2
* 4.4.3 <u>End item inspection</u> . The inspection lot shall be all the bull's eyes of one type offered for inspection at one time.	
* 4.4.3.1 <u>Visual examination</u> . The bull's eyes shall be examined for the defects listed in table II. The inspection level shall be II with an AQL of 2.5 for major defects and 6.5 for total defects, expressed in terms of defects per hundred units.	

TABLE II. Classification of defects

<u>Examine</u>	<u>Defect</u>	<u>Classification</u>	
		<u>Major</u>	<u>Minor</u>
Finish	Not finished	X	
	Color of finish is not as specified		X
	Not smooth and uniform		X
	Area of thin or no film		X
	Sag, run, or drop		X
Construction and workmanship (applicable to all bull's eyes)	Any bull's eyes not fabricated of the applicable referenced material	X	
	Not fabricated as specified	X	
	Not clean, i.e., has dirt or grease		X
Type I bull's eyes	Not sound	X	
	Not smooth		X
	Fracture	X	

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TABLE II. Classification of defects (cont'd)

Examine	Defect	Classification	
		Major	Minor
Type II bull's eyes	Body has knot or split	X	
	Body not smooth		X
	Not assembled, i.e., retainer not in groove	X	

- * 4.4.3.2 Dimensional examination. The bull's eyes shall be examined for compliance with dimensions specified. Any dimension not within the specification tolerance shall be a defect. The inspection level shall be S-2 with an AQL of 4.0, expressed in terms of defects per hundred units.

4.4.4 Examination of preparation for delivery. An examination shall be made to determine that packaging, packing, and markings are in compliance with section 5 of this specification. Defects shall be scored as specified in table III. The sample unit for this examination shall be one shipping container fully prepared for delivery, except that it need not be sealed. The lot shall be the number of containers offered for inspection at one time. The inspection level shall be S-2 with an AQL of 4.0, expressed in terms of defects per hundred units. Defects of closure, strapping or tape banding listed in table III shall be examined on shipping containers fully prepared for delivery.

TABLE III. Examination of preparation for delivery

Examine	Defect
Markings (exterior and interior)	Missing, incorrect or illegible.
Materials	Any nonconforming component, component missing.
Workmanship	Inadequate application of components such as incomplete closure of container, loose strapping or tape banding. Bulging or distortion of container. Container not compact or not well filled.
Contents	Content per container is more or less than required.

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5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A or C as specified (see 6.2).

5.1.1 Level A. Unless otherwise specified (see 5.1.1.1), one thousand type I, or five hundred type II bull's eyes shall be packaged in a snug-fitting fiberboard box conforming to style ESC, type CF, variety SW, or type SF, class domestic, grade 200 of PPP-B-636. Each box shall be agitated during filling to assure a compact and well-filled box. Closure shall be in accordance with method II of the appendix of PPP-B-636.

* **5.1.1.1** When specified (see 6.2), bull's eyes shall be packaged in quantities other than specified in 5.1.1 in multiples of ten, and in boxes conforming to PPP-B-566, PPP-B-636, PPP-B-665, or PPP-B-676. The weight of contents shall not exceed the weight limitations for the applicable box specification. Closure shall be in accordance with the appendix of the applicable box specification.

5.1.2 Level C. Bull's eyes shall be packaged to afford adequate protection against damage during shipment from the supply source to the first receiving activity. The supplier may use his standard practice, when it meets this requirement.

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

5.2.1 Level A. Unless otherwise specified (see 6.2), six thousand type I, or three thousand type II bull's eyes, packaged as specified in 5.1, shall be packed in a snug-fitting fiberboard or nailed wood shipping container conforming to style FTC, V3s of PPP-B-636; or class 2, style 2 or 4, type 2 load of PPP-B-621, respectively. Nailed wood shipping containers shall be provided with a type I or II, grade C case liner conforming to MIL-L-10547. Fiberboard shipping containers shall be closed by taping all seams in accordance with the appendix to PPP-B-636. Reinforcing with flat strapping or tape banding shall be in accordance with the appendix of the applicable container specification.

5.2.2 Level B. Unless otherwise specified (see 5.2.2.1 and 6.2), six thousand type I or three thousand type II bull's eyes, packaged as specified in 5.1, shall be packed in a snug-fitting fiberboard or nailed wood shipping container conforming to style FTC, type CF, class domestic, variety DW, grade 350 of PPP-B-636; or class 1, style 2 or 4, type 2 load of PPP-B-621, respectively. Each fiberboard shipping container shall be closed and reinforced with flat strapping or tape banding in accordance with the class weather-resistant requirements in the appendix of PPP-B-636. Each nailed wood shipping container shall be closed and strapped in accordance with the appendix of PPP-B-621.

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5.2.2.1 When specified (see 6.2), weather-resistant fiberboard specified in 5.2.1 shall be used for the shipping container when fiberboard shipping containers are utilized.

- * 5.2.3 Level C. Bull's eyes, packaged as specified in 5.1, shall be packed in a manner to insure carrier acceptance and safe delivery at destination at the lowest transportation rate for such supplies. Containers shall be in accordance with Uniform Freight Classification Rules or National Motor Freight Classification Rules, as applicable.

5.3 Marking. In addition to any special marking required by the contract or order, interior packages and shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. The bull's eyes covered by this specification are intended to be used with tents, awning and similar items of equipage. The two types are interchangeable and are intended to be used in rigging as a substitute for pulleys.

- * 6.2 Ordering data. Procurement documents should specify the following:

- (a) Title, number and date of this specification.
- (b) Type of bull's eye required (see 1.2).
- (c) When a first article is required (see 3.1, 4.3 and 6.3).
- (d) Selection of applicable levels of packaging and packing (see 5.1 and 5.2).
- (e) Quantity of bull's eyes per package and pack, if other than specified (see 5.1.1.1, 5.2.1 and 5.2.2).
- (f) When weather-resistant fiberboard is required for level B pack (see 5.2.2.1).

- * 6.3 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of ASPR 7-104.55. The first article should be a preproduction sample, initial production item or other specific item described under the definition of a first article in the ASPR. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should include specific instructions in all procurement instruments regarding arrangements for inspection and approval of the first article.

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- * 6.4 Revision changes. The margins of this specification have been marked with an asterisk (*) to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and suppliers are cautioned to evaluate the requirements of this document based on the entire content as written, irrespective of the marginal notations and relationship to the last previous issue.

Custodian:

Army - GL

Review activity:

DSA - IS

User activities:

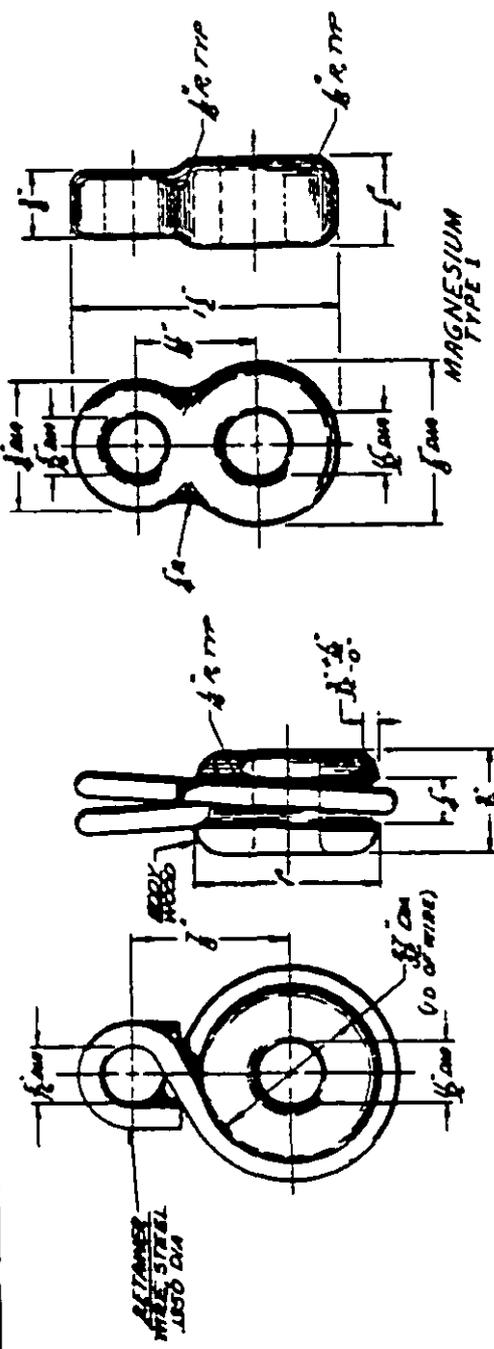
Army - AT, AV, MI

Preparing activity:

Army - GL

Project No. 3940-A010

XL-8-34811 (67)



WOOD & STEEL WIRE
TYPE 2

MAGNESIUM
TYPE 1

FIG 1 THIS FIGURE IS A MINATURE COPY OF AN ARMY NANCE LABORATORIES
DRAWING AND IS FOR INFORMATION ONLY.
THE DRAWING REFERENCE IN PARAGRAPH 2.1 GOVERNS.

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS FOLLOW UNLESS NOTED
DIMENSIONS IN INCHES & FRACTIONS
AND FRACTIONS OF INCHES
NOTE: METAL CIRCLES EXCLUDED

C	UNLESS OTHERWISE SPECIFIED	UNLESS OTHERWISE SPECIFIED
B	REVISED	REVISED
A	ORIGINAL	ORIGINAL
DEPARTMENT OF THE ARMY QUARTERMASTER CORPS WASHINGTON, D. C.		
BULL'S EYE RIGGING, 5/8 INCH INSIDE DIAMETER		
SPEC. NO. MIL-B-2481 DATE 4-1-56 CODE 89007		

DESIGN	PROJ. NO.	REV.	DATE
WOOD & STEEL WIRE TYPE 2			
DESIGNED BY	CHECKED BY	APPROVED BY	

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS FOLLOW UNLESS NOTED
DIMENSIONS IN INCHES & FRACTIONS
AND FRACTIONS OF INCHES
NOTE: METAL CIRCLES EXCLUDED

SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 22-R255
<p>INSTRUCTIONS: This sheet is to be filled out by personnel, either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity. Comments and suggestions submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or serve to amend contractual requirements.</p>		
<p>SPECIFICATION MIL-B-2481E(GL) BULL'S EYES, RIGGING, 5/16 INCH INSIDE DIAMETER</p>		
<p>ORGANIZATION</p>		
<p>CITY AND STATE</p>		<p>CONTRACT NUMBER</p>
<p>MATERIAL PROCURED UNDER A <input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT</p>		
<p>1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE? A. GIVE PARAGRAPH NUMBER AND WORDING.</p>		
<p>B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES</p>		
<p>2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID</p>		
<p>3. IS THE SPECIFICATION RESTRICTIVE? <input type="checkbox"/> YES <input type="checkbox"/> NO (If "yes", in what way?)</p>		
<p>4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)</p>		
<p>SUBMITTED BY (Printed or typed name and activity - Optional)</p>		<p>DATE</p>

DD FORM 1426
1 JAN 66

REPLACES EDITION OF 1 OCT 64 WHICH MAY BE USED.