INCH-POUND

MIL-DTL-3390G
19 November 2007
SUPERSEDING
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8 September 1988

DETAIL SPECIFICATION

RINGS, DEE

Reactivated after 19 November 2007 and may be used for new and existing designs and acquisitions.

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

1. SCOPE

1.1 Scope. This specification covers dee rings for use on various equipage items (see 6.1).

1.2 Classification. The dee rings shall be of the configurations shown by letter designations on Drawing 4-1-454 or 4-1-455, as specified (see 6.2) and shall be of the following classes and sizes for the configuration shown. Configuration X shall be style 1 (without roller) or style 2 (with roller) as specified (see 6.2).

1.2.1 Classes. Classes of dee rings shall be as follows (see 6.1) and as specified (see 6.2):

Class 1 - Brass
Class 2 - Steel wire
Class 3 - Malleable iron
Class 4 - Nickel-silver alloy
Class 5 - Molding plastic (nylon) rigid

1.2.2 Sizes. Configurations A, D, K, L, W, and X are available in various sizes as shown on Drawing 4-1-454 and as specified (see 6.2).

Comments, suggestions, or questions on this document should be addressed to Defense Supply Center Richmond, ATTN: DSCR-VEB, 8000 Jefferson Davis Highway, Richmond, VA 23297-5616 or e-mailed to STDZNMGT@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST database at http://assist.daps.dla.mil/.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of the documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

FEDERAL STANDARDS

FED-STD-595 - Colors Used in Government Procurement (Color Chip 27038).

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-F-495 - Finish, Chemical, Black, for Copper Alloys.

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-1916 - DoD Preferred Methods for Acceptance of Product.

(Copies of these documents are available online at http://assist.daps.dla.mil/ or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other government drawings. The following other government drawings form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DRAWINGS

U.S. ARMY NATICK RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER

4-1-454 - Rings, Dee, SYM A, C, D, K, L, M, U, W, and X.
4-1-455 - Rings, Dee, SYM B, E, F, G, H, J, R, T, and V.

(Copies of drawings required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.3 Non-government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

ASTM INTERNATIONAL

ASTM B 21/B 21M	- Standard Specification for Naval Brass Rod, Bar, and Shapes.
ASTM B 36/B 36M	- Standard Specification for Brass Plate, Sheet, Strip, and Rolled Bar.
ASTM A 47/A 47M	- Standard Specification for Ferretic Malleable Iron Castings.
ASTM B 206/B 206M	- Standard Specification for Copper-Nickel-Zinc (Nickel Silver) Wire and Copper-Nickel Alloy Wire.
ASTM B 584	- Standard Specification for Copper Alloy Sand Castings and General Applications.
ASTM B 633	- Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
ASTM A 853	- Standard Specification for Steel Wire, Carbon, for General Use.
ASTM E 1282	- Standard Guide for Specifying the Chemical Compositions and Selecting Sampling Practices and Quantitative Analysis Methods for Metals, Ores, and Related Materials.
ASTM D 4066	- Standard Classification System for Nylon Injection and Extrusion Materials (PA).

(Copies of these documents are available at http://www.astm.org/ or from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.)

MASTER PAINTERS INSTITUTE

Reference 94	- Alkyd, Exterior, Semi-Gloss (MPI Gloss Level 5).

(Copies of this document are available at http://www.paintinfo.com/ or from Master Painters Institute, 2800 Ingleton, Ave., Burnaby, BC V5C 6G, Canada.)

SOCIETY OF AUTOMOTIVE ENGINEERING

SAE AMS 2460	- Plating, Chromium.
SAE AMS-QQ-P-416	- Plating, Cadmium (Electrodeposited).

(Copies of these documents are available at http://www.sae.org/ or from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

2.4 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 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 4.2).

3.2 Materials. The materials specified shall conform to applicable specifications and requirements specified herein. Commercial tolerances apply to wire diameters.

3.2.1 Copper alloy casting. The copper alloy (brass) castings shall conform to alloy no. A3 of ASTM B 584.

3.2.2 Brass sheet or strip. The brass sheet or strip shall conform to copper alloy no. 260 or no. 268, temper half-hard, of ASTM B 36/B 36M.

3.2.3 Wire, copper alloy. The copper alloy wire shall conform to copper alloy no. 260 or no. 270, quarter-hard temper, of ASTM B 206/B 206M, or copper alloy no. 462 or no. 464, temper half-hard or light annealed, of ASTM B 21/B 21M.

3.2.4 Steel wire. Steel wire shall conform to steel number 1006, 1008, or 1010, finish 1, annealed in process, of ASTM A 853.

3.2.5 Malleable iron. Malleable iron castings shall conform to grade 35018 of ASTM A 47/A 47M.

3.2.6 Nickel-silver alloy. Nickel-silver alloy castings shall conform to table I for chemical composition when tested as specified in 4.3.1.

TABLE I. Chemical composition, copper-nickel-zinc alloy.

Material	Percent
Copper	55.0 to 64.0
Nickel	18.0 (min.)
Zinc	Remainder
Iron	0.35 (max.)
Other	0.25 (max.)

3.2.7 Enamel. The enamel shall be semi-gloss enamel alkyd conforming to Master Painters Institute (MPI) Reference 94.

3.2.8 Plastic, nylon. The plastic dee rings shall be molded from virgin nylon conforming to PA 181, polyamide nylon, group 1 (66 nylon), class 8 (weather stabilized), grade 1 of ASTM D 4066. Clean unburned plastic material in the form of imperfect parts, sprues, runners or other scrap of the

same composition as the virgin material, and produced in the molding or finishing operation, may be reground and mixed with the virgin material specified. When reground is mixed with the virgin material, the reground shall not exceed a level of 25 percent by weight of the blended mixture.

3.2.9 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements and promotes economically advantageous life cycle costs.

3.3 Design and construction. The design and construction of the rings shall conform to Drawings 4-1-454, and 4-1-455, and the requirements specified herein. All burrs, sharp edges, and slivers shall be removed before application of any finish.

3.3.1 Class 1 rings. At the option of the supplier, class 1 rings shall be cast of brass material specified in 3.2.1 or formed of brass wire specified in 3.2.3, except when one material only is shown on the applicable drawing. Available configurations are A, B, E, F, G, H, J, K, L, W, and X. After forming to shape and locating the joint as shown on the drawing, the joint shall be joined by butt resistance welding or brazing. The completed joints shall be round and smooth and free of cracks, burns, or reduced areas. The rings shall be free of porosity, blow holes, warp, and clearly noticeable digs and gouges.

3.3.2 Class 2 rings. Class 2 rings shall be fabricated of steel wire specified in 3.2.4. After forming to shape and locating the joint as shown on the drawing, the joint shall be butted and welded, except that unless otherwise specified (see 6.2), configuration "A" rings shall be butted only. The welds shall be sound, not porous, and free from cracks, burns, or reduced areas. The welds shall be ground smooth and free of rough edges. The rings shall be free of porosity, blow holes, warp, and clearly noticeable digs and gouges. Available configurations are indicated on the drawings by the letters A, D, E, F, H, K, L, M, R, T, U, V, and X.

3.3.3 Class 3 rings. Class 3 rings shall be cast from malleable iron specified in 3.2.5. Available configurations are A, B, E, F, G, J, W, and X. The rings shall be free of porosity, blow holes, warp, and clearly noticeable digs and gouges.

3.3.4 Class 4 rings. Class 4 rings shall be cast from nickel-silver alloy specified in 3.2.6, conforming to configuration C. The rings shall be free of porosity, blow holes, warp, and clearly noticeable digs and gouges.

3.3.5 Class 5 rings. Class 5 rings shall be molded of plastic specified in 3.2.8. The available configuration is X.

3.3.6 Rollers. The rollers required for configurations U, V, and X (style 2) shall be fabricated of brass sheet or strip specified in 3.2.2 and to the dimensions shown on drawings. After assembly to the straight section of the ring, the rollers shall rotate freely without binding and the joint of the roller along its entire length shall be butted evenly.

3.4 Finishes. The finished rings shall be free from corrosion, dirt, discoloration and areas of no finish. Finishes shall be as follows:

3.4.1 Black chemical. Black chemical finish shall conform to MIL-F-495.

3.4.2 Zinc-plate.

3.4.2.1 Zinc-plate without enameling. Zinc-plate without enameling shall conform to type II, SC2 of ASTM B 633.

3.4.2.2 Zinc-plate with enameling. Zinc-plate with enameling shall conform to type II, SC2 of ASTM B 633, followed by baking enamel. The enamel shall conform to 3.2.7.

3.4.3 Cadmium plate. Cadmium plate shall conform to class 1 or class 2, type I or type II of SAE AMS-QQ-P-416.

3.4.4 Chromium plate. Chromium plate shall conform to class 1 of SAE AMS 2460.

3.4.5 Class 1 rings. All class 1 rings, except configuration L, shall be finished as specified in 3.4.1.

3.4.5.1 Configuration L. Configuration L rings, except class 1 (1 inch X 7/8 inch), shall be given a bright polished finish. Configuration L class 1 rings (1 inch X 7/8 inch) shall be given either a bright polished finish or the chromium finish specified in 3.4.4, as specified (see 6.2). The chromium plate thickness shall be not less than 0.0002 inch.

3.4.6 Class 2 rings. All class 2 rings, except configurations L and X, shall be given a finish specified in 3.4.2.2. The enamel coating shall level out to a uniform dry film thickness without orange peel, wrinkles, drops, streaks or areas of no film.

3.4.6.1 Configuration L. At the option of the supplier, configuration L, class 2 dee rings shall be given either the finish specified in 3.4.2.1 or the class 2, type II finish specified in 3.4.3.

3.4.6.2 Configuration X. Configuration X, class 2 dee rings shall be given the type I, class 2 finish specified in 3.4.2.1 or the class 1, type I finish specified in 3.4.3, as specified (see 6.2).

3.4.7 Class 3 rings. All class 3 dee rings shall be given the finish specified in 3.4.2.2. The enamel coating shall level out to a uniform dry film thickness without orange peel, wrinkles, drops, streaks, or areas of no film.

3.4.8 Class 4 rings. All class 4 dee rings shall be ground and polished to a bright finish.

3.4.9 Class 5 rings. The surfaces of the class 5 dee rings shall have a smooth and lusterless or semi-gloss finish. All surfaces shall be free of dirt, dust, and foreign matter inclusion. The finish shall be produced from a die that has the cavity surfaces finished in a vapor blast, water hone, or similar satin finish, and not result from the application of any protective coating lacquers or other materials. The resultant surface gloss shall not exceed that of semi-gloss black color chip number 27038 of FED-STD-595 by visual comparison.

4. VERIFICATION

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

a. First article inspection (see 4.2).
b. Conformance inspection (see 4.3).

4.2 First article inspection. When first article is required (see 6.2), the dee rings shall be examined for the defects specified in table II, the dimensions specified, and the tests of 4.3. The presence of any defect shall be cause for rejection of the first article.

TABLE II. End item visual defects.

Examination		Defect	Classification	
			Major	Minor
Finish	General	Not type specified	X	
		Evidence of corrosion	X	
	Black chemical	Color not as specified		X
		Finish not clean and uniform		X
		Area of no finish or finish discolored		X
	Enamel	Area of no film or color not as specified	X	
		Separation of color or finish rough (i.e., lint, dust, dirt, or other foreign matter embedded in finish)		X
		Finish not continuous, smooth, and adherent (i.e., orange peel, wrinkles, drops, streaks)		X
	Zinc, chromium, and cadmium plated	Coating omitted or area of no coating	X	
		Coating not smooth, uniform, fine-grained, or not tightly adherent (i.e., flaky, blistered, or peeling); or coating is scratched, stained, discolored, shaded, broken, or cut through or is not free from pits, modules, or indications of burning		X
	Plastic	Not smooth, lusterless, or semi-gloss black	X	
		Gloss exceeds color chip no. 27038 when compared visually		X
	Polished finish	Polish not bright	X	
		Buff drag, cloudy, hazy, or mottle, finish clearly noticeable		X

TABLE II. End item visual defects - Continued.

Examination	Defect	Classification	
		Major	Minor
Construction and workmanship	Sharp edge or projection that may cause injury	X	
	Cracked, broken, bent, malformed, or damaged	X	
	Pronounced tool or forming marks		X
Casting	Miscast, incomplete, or contains blowholes or evidence of porosity	X	
Roller (when applicable)	Does not turn freely	X	
	Joint not butted	X	
Workmanship of welds or brazing	Weld or brazing missing, unless welding is not required		X
	Completely broken or not fused	X	
	Cracked, partially broken, incomplete, or evidence of poor fusion or burn through		X
	Evidence that weld contains gas pockets or has been undercut or that excess flux or spatter has not been removed		X

4.3 Conformance inspection. Unless otherwise specified herein, sampling for conformance inspection shall be performed in accordance with MIL-STD-1916.

4.3.1 Component and material inspection. Unless otherwise specified herein or in the acquisition order (see 6.2), components and materials shall be inspected in accordance with all the requirements of the referenced documents. In addition, copper-nickel-zinc alloy shall be tested as specified in table III. Nonconformance to the requirements of 3.2.6 shall constitute cause for rejection of the lot.

TABLE III. Material tests, copper-nickel-zinc alloy.

Lot size	Characteristic	Test method	Number of determinations (composite)	Sample unit	Results reported as	Verification level
100 lbs	Chemical composition	ASTM E 1282	2 for each element	4 oz of material	Nearest 0.1 percent each element	I

4.3.1.1 Inspection of nylon plastic material. Each batch of reground material, when applicable, shall be inspected for compliance with the requirements specified in 3.2.8. Any batch containing reground nylon plastic material exceeding 25 percent of a blended mixture with virgin nylon material shall be cause for rejection of the batch.

4.3.2 In-process inspection.

4.3.2.1 Process examination. In-process examination shall be conducted to ensure that class 2 and class 3 rings, except configurations L and X, have had the phosphate treated zinc-plate applied before enameling as specified in 3.4.2.2.

4.3.2.2 In-process visual examination of welded or brazed rings without roller. Welded or brazed ring configurations requiring rollers shall be examined before finishing and assembling the roller to determine conformance with 3.3.1 or 3.3.2. The lot shall be all unfinished rings without roller assembled of one configuration, class, and size offered for inspection at one time. The sample unit for this examination shall be one ring. The verification level shall be level I in accordance with MIL-STD-1916.

4.3.3 End item inspection.

4.3.3.1 End item visual examination. The end items shall be examined for the defects listed in table II. The lot size shall be expressed in units of finished rings of one configuration, class, size, and style, as applicable. The sample unit shall be one completely fabricated and finished ring. The verification level shall be level II in accordance with MIL-STD-1916.

4.3.3.2 End item dimensional examination. The end items shall be examined for compliance with all dimensions specified. The lot size shall be expressed in units of one configuration, class, size, and style, as applicable. The sample unit shall be one completely fabricated and finished ring. The verification level shall be level II in accordance with MIL-STD-1916.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the inventory control point's packaging activities within the military service or defense agency, or within the military service's system command. Packaging data retrieval is available from the managing military department's or defense agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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

6.1 Intended use.

6.1.1 Class 1 rings. Class 1 rings, other than configurations W, X, and L, are intended for use in conjunction with textile, webbing, and leather items where the corrosion products of ferrous metals may adversely affect the textile, webbing, and leather items.

6.1.2 Classes 2 and 3 rings. Class 2 and 3 rings, other than configurations X and D, are intended for use as alternates to class 1 rings in periods of emergency. These also may be used where a specific requirement for additional strength is necessary.

6.1.3 Class 4 rings. Class 4 rings are intended for use on animal equipment in special applications where high resistance to corrosion is required.

6.1.4 Configurations W, X, and L rings. Configuration W rings are generally used on munition command items; configuration X rings are generally used on weapons command items; configuration L rings are generally used on electronic command items.

6.1.5 Configuration D rings. Configuration D rings are generally used on animal equipment.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. Configuration required (see 1.2 and 1.2.2).
c. Size required, when applicable (see 1.2 and 1.2.2).
d. Style required, when applicable (see 1.2).
e. Class required (see 1.2.1).
f. First article inspection, when required (see 3.1 and 4.2).
g. When configuration A ring shall be welded (see 3.3.2).
h. Finish required (see 3.4.5.1 and 3.4.6.2).
i. Component and material conformance inspection requirements, if different (see 4.3.1).
j. Packaging (see 5.1).

6.3 Subject term (key word) listing.

animal equipment
equipage
leather
rollers
textile
webbing

6.4 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Custodians:
Army - GL
Navy - MC
Air Force - 99

Preparing Activity:
DLA - GS4

(Project 5365-2007-001)

Review Activity:
Army - CR4

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST database at http://assist.daps.dla.mil/.