INCH-POUND

MIL-C-10375C(AR)
3 April 1991
SUPERSEDING
MIL-C-10375B
26 February 1965

MILITARY SPECIFICATION

CUPS, CASE, COPPER ALLOY
(FOR SMALL ARMS AMMUNITION)

This specification is approved for use by the U.S. Army Armament, Munitions and Chemical Command and is available for use by all Department and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers annealed copper alloy case cups used in the manufacture of cartridge cases for small arms ammunition.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specification and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

MILITARY

MIL-A-48078 -Ammunition, Standard Quality Assurance Provisions, General Specifications for

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, U.S. Army ARDEC, ATTN: SMCAR-BAC-S, Picatinny Arsenal, New Jersey 07806-5000 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
DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

FSC 1305

STANDARDS

MIL-STD-1232	-Visual Inspection Standards for Cups and Disks used in Small Arms Ammunition Manufacture

(Unless otherwise indicated, copies of federal and military specifications and standards are available from the Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia PA 19111-5094.)

2.1.2 Other Government documents, drawings and publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

DRAWINGS

U.S. ARMY ARMAMENT, RESEARCH, DEVELOPMENT AND ENGINEERING CENTER (ARDEC)

5203372	-Cup (4 DRAW), 7.62mm
5203381	-Cup (3 DRAW), Caliber .50
10521301	-Cup (3 DRAW), 7.62mm
10522459	-Cup (3 DRAW), 7.62mm, NATO
10542547	-Cup (3 DRAW), 5.56mm
11828914	-Cup (2 DRAW), 5.56mm
P5203372	-Special Packaging Instructions for Cup (4 Draw), 7.62mm
P5203381	-Special Packaging Instructions for Cup (3 Draw), Caliber .50
P10521301	-Special Packaging Instructions for Cup (3 Draw), 7.62mm
P10522459	-Special Packaging Instructions for Cup (3 Draw), 7.62mm, NATO
P10542547	-Special Packaging Instructions for Cup (3 Draw), 5.56mm
P11828914	-Special Packaging Instructions for Cup (2 Draw), 5.56mm

(Copies of other Government documents, drawings and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer).

2.2 Non-Government publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issue of the non-government documents which is current on the date of the solicitation.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM-B19	-Standard Specification for Cartridge Brass Sheet Plat Bar and Disks (Blanks)
ASTM-E112	-Standard Test Methods for Determining Average Grain Size.

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

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 General. The cartridge case cup shall comply with the requirements specified on the applicable drawing and referenced specifications and shall process satisfactorily into a cartridge case.

3.2 First article inspection. This specification makes provision for first article inspection. Requirements for submission of first article samples by the contractor shall be as specified in the contract or in this document.

3.3 Grain size. The cups shall be procured in a final annealed state unless otherwise specified by the contracting officer. The case cup grain size shall comply with the requirements specified on the applicable drawing.

3.4 Workmanship. The requirements for workmanship are as specified on the applicable drawings, referenced specifications and the following.

3.4.1 Metal defects. The cup shall be free of lamination, slivers, blisters, laps, cracks, scale, scratches, dents, bent sidewalls, "V'd" and wire edges.

3.4.2 Foreign matter. The cup shall be clean and free of oil, grease, dirt, grit, oxidation, stains, red spots, chips, and dichromate residue.

3.4.3 Coating. The cup shall be coated with a residual film of neutral soap.

3.4.4 Bismuth, antimony and iron content. The supplier shall submit a Certificate of Compliance with each lot of cups to verify that each lot meets the material requirements of ASTM-B19, and shall verify that the bismuth content of the material in each lot does not exceed .002%, that the antimony content of the material in each lot does not exceed .01% and that the iron content of the material in each lot does not exceed .05% acceptance of material is contingent upon receipt of certification of compliance.

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. 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 specification 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 section 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to 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.

4.1.2 Certification of materials. A certification of conformance shall be submitted by the material manufacturer for each lot utilized confirming the material parameters as per requirements specified in drawing and applicable documents. Additionally, the latest audit data for the additional parameters listed on the manufacturer specification are to be supplied with the certification.

4.2 Classification of inspection. The following types of inspections shall be conducted on these items:

a. First article inspection (see 4.3).

b. Quality conformance inspection (see 4.4).

4.3 First article inspection. A first article inspection shall be required to comply with the contract requirements when:

There is a change in the processing parameters.

4.3.1 First article samples. The contractor shall submit a first article sample as designated by the contracting officer for evaluation in accordance with provisions of 4.3.2 and 4.3.3. A first article sample consisting of 5200 cups shall be submitted for the specified tests. Components or items shall be taken at random from each batch used to produce the part in the quantity specified and shall be so identified as to permit tracing each item to the batch in which it was made. The first article sample shall be of the same design as will be submitted for regular production. It shall be manufactured using the same materials, equipment, processes and procedures as will be used for regular production. The first article sample shall not be specially selected or custom made in a way that causes the product quality to be different than that expected from regular production. After inspection and provisional acceptance at source, 200 cups of the first article sample shall be inspected at the Government approved facility for all requirements of the drawings and specifications, and the remaining 5000 cups shall be used for performance of the work test. The Government reserves the right to require new initial production samples until such time as an acceptable sample is submitted.

4.3.3 Rejection. If any assembly, component or test specimen fails to comply with any of the applicable requirements, the first article sample shall be rejected. The Government reserves the right to terminate its inspection upon any failure of any assembly, component, or test specimen in the sample to comply with any of the stated requirements.

TABLE I. First article inspection

CLASSIFICATION OF CHARACTERISTICS

MIL-C-10375C(AR)

PARAGRAPH	TITLE		SHEET	DRAWING NUMBER
	Cup		1 OF 1	As Applicable
				NEXT HIGHER ASSEMBLY

CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	INSPECTION METHOD REFERENCE
	Examination for Defects	200 0-1	3.1	4.4.2.1
	Grain Size	15 0-2	3.3	4.5.1
	Workability	5000 ---	3.1	4.5.2

NOTES:

* Packaging drawings not included.

AMSMC Form 1570a, 1 Jul 89

Replaces AMSMC Form 1570a, 1 Apr 85, which may not be used.

4.4 Quality conformance inspection.

4.4.1 Inspection lot formation. The term "inspection lot" is defined as a homogeneous collection of units of product from which a representative sample is drawn or which is inspected 100 percent to determine conformance with applicable requirements. Units of product selected for inspection shall represent only the inspection lot from which drawn and shall not be construed to represent any prior or subsequent quantities presented for inspection. Homogeneity shall be considered to exist provided the inspection lot has been produced by one manufacturer in one unchanged process, using the same materials, the same material batch, and the same methods, in accordance with the same drawing, same drawing revision, same specification, same specification revision and manufactured under essentially the same conditions, and at essentially the same time. All material submitted for inspection in accordance with this specification shall comply with the homogeneity criteria specified herein, regardless of the type of inspection procedure which is being applied to determine conformance with requirements.

4.4.2 Examination and tests.

a. Classification of characteristics. Quality conformance examinations and tests are specified in the following Classification of Characteristics paragraphs. The contractor's quality program or detailed inspection plan shall provide assurance of compliance of all characteristics with the applicable drawing and specification requirements utilizing as a minimum the conformance criteria specified herein. Where specified herein, attributes sampling inspection shall be conducted in accordance with Table II below, using the inspection levels cited in the Classification of Characteristics paragraphs.

TABLE II. SAMPLING

Lot size	Inspection Level					
	I	II	III	IV	V	VI
2 to 8	*	*	*	*	5	3
9 to 15	*	*	*	13	5	3
16 to 25	*	*	*	13	5	3
26 to 50	*	*	32	13	5	3
51 to 90	*	*	32	13	12	4
91 to 150	*	125	32	13	12	5
151 to 280	*	125	32	30	14	6
281 to 500	*	125	32	30	17	7
501 to 1200	*	125	74	35	20	9
1201 to 3200	1250	125	74	43	24	10
3201 to 10000	1250	125	87	50	30	10
10001 to 35000	1250	296	109	61	36	10
35001 to 150000	1250	296	124	74	40	10
150001 to 500000	1250	346	156	91	40	10
500001 and over	1250	431	187	102	40	10

Numbers under inspection levels indicate sample size; asterisks indicate one hundred percent inspection. If sample size exceeds lot size, perform one hundreds percent inspection. Accept on zero and reject on one or more for all inspection levels.

b. Alternative inspection provisions. Alternative inspection procedures, methods, or equipment, such as statistical process control, tool control, other types of sampling procedures, etc., may be used by contractor when they provide, as a minimum, the level of quality assurance required by the provisions specified herein. Prior to applying such alternative procedures, methods, or equipment, the contractor shall describe them in a written proposal submitted to the Government for evaluation and approval (see 6.6). When required, the contractor shall demonstrate that the effectiveness of each proposed alternative is equal to or better than the specified quality assurance provisions herein. In cases of dispute as to whether the contractor's proposed alternative provides equal assurance, the provisions of this specification shall apply. All approved alternative inspection provisions shall be specifically incorporated into the contractor's quality program plan or detailed inspection system, as applicable.

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF CHARACTERISTICS

PARAGRAPH	TITLE	SHEET 1 OF 4	DRAWING NUMBER
4.4.2.1	Cup		As Applicable
			NEXT HIGHER ASSEMBLY

CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	INSPECTION METHOD REFERENCE
CRITICAL	None defined.			
MAJOR				
101.	Scaly metal	Level II	3.4, 3.4.1	Visual 2/
102.	Improperly formed or mutilated	Level II	3.4, 3.4.1	Visual 2/
103.	Scrap (Web scrap "Scoops", "Bucket Handles")	Level II	3.4, 3.4.1	Visual 2/
104.	Laminations or Laps	Level II	3.4, 3.4.1	Visual 2/
105.	Scratches 1/	Level II	3.4, 3.4.1	Visual 2/
106.	Outside Diameter	Level II	3.1	SMTE
107.	Base Thickness	Level II	3.1	SMTE
108.	Wall Thickness	Level II	3.1	SMTE
109.	Wall Thickness Variation	Level II	3.1	SMTE

NOTES: 1/ A scratch which is .005 inch or greater in depth shall be considered unacceptable.

2/ Refer to applicable brass cup section of MIL-STD-1232 for Visual defect standards for Visual defects listed in Table I.

AMSMC Form 1570a, 1 Jul 89

Replaces AMSMC Form 1570a, 1 Apr 85, which may not be used.

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF CHARACTERISTICS

PARAGRAPH	TITLE	SHEET 2 OF 4	DRAWING NUMBER
4.4.2.1	Cup		As Applicable
			NEXT HIGHER ASSEMBLY

CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	INSPECTION METHOD REFERENCE
MAJOR				
110.	Wall Height Variation	Level II	3.1	SMTE
111.	Mouth bevel	Level II	3.1	SMTE
112.	Weight	Level II	3.1	SMTE
113.	Mixed Cups	Level II	3.1	SMTE
114.	Mixed Cups	Level II	3.1	Visual
115.	Wire Edge	Level II	3.4, 3.4.1	Visual 2/
116.	Wire edge over 30% of circumference on inside or outside edge of cup (5.56-mm, 2-draw only)	Level II	3.4, 3.4.1	Visual 2/
117.	Scaly metal, slivers, blisters, or cracks over 1/8" in diameter or length (5.56-mm, 2-draw only)	Level II	3.4, 3.4.1	Visual 2/
118.	V'd edge on cup (cropping when blanking; 5.56-mm, 2-draw only)	Level II	3.4, 3.4.1	Visual 2/

NOTES:

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF CHARACTERISTICS

PARAGRAPH	TITLE	SHEET	DRAWING NUMBER
4.4.2.1	Cup	3 OF 4	As Applicable
			NEXT HIGHER ASSEMBLY

CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	INSPECTION METHOD REFERENCE
119.	Large dents, any surface (5.56-mm, 2-draw only)	Level II	3.4, 3.4.1	Visual 2/
120.	Oxidation or corrosion, more than 1/4" of inside or outside surface area (5.56-mm, 2-draw only)	Level II	3.4, 3.4.1	Visual 2/
121.	Bend sidewalls (5.56mm, 2 draw only)	Level II	3.4, 3.4.1	Visual 2/
122.	Scratches exceeding .003" deep, 1/32" wide, or 3/8" long	Level II	3.4, 3.4.1	Visual 2/
MINOR				
201.	Oil, grease, dirt	Level II	3.4, 3.4.2	Visual 2/
202.	Dents or bent edges	Level II	3.4, 3.4.2	Visual 2/
203.	Oxidation	Level II	3.4, 3.4.2	Visual 2/
204.	Red Spots	Level II	3.4, 3.4.2	Visual 2/
205.	Wire edge under 30% of circumference on inside or outside edge of cup (5.56-mm, 2-draw only)	Level II	3.4, 3.4.1	Visual 2/

NOTES:

CLASSIFICATION OF CHARACTERISTICS

PARAGRAPH	TITLE	SHEET	DRAWING NUMBER
4.4.2.1	Cup	4 OF 4	As Applicable
			NEXT HIGHER ASSEMBLY

CLASSIFICATION	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	INSPECTION METHOD REFERENCE
208.	Scaly metal, slivers, blisters, or cracks under 1/8" in diameter or length (5.56-mm, 2-draw only)	Level II	3.4, 3.4.1	Visual 2/
209.	Oxidation or corrosion, less than 1/4" of inside or outside surface area (5.56-mm, 2-draw only)	Level II	3.4, 3.4.1	Visual 2/
210.	Scratches less than .003" deep, 1/32" wide, or 3/8" long	Level II	3.4, 3.4.1	Visual 2/
SPECIAL				
301.	Absence of neutral soap film		3.4.3	Certification
302.	Dichromate residue		3.4.2	Certification

NOTES:

4.4.3 Testing. Testing is described in the first article and quality conformance inspection tables.

4.4.4 Inspection equipment. The inspection equipment required to perform the examination and tests prescribed herein is described in the "Paragraph Reference/Inspection Method" column in the tables starting with 4.4.2.1. The contractor shall submit for approval inspection equipment designs in accordance with the terms of the contract. See Section 6 of MIL-A-48078 and 6.3 herein.

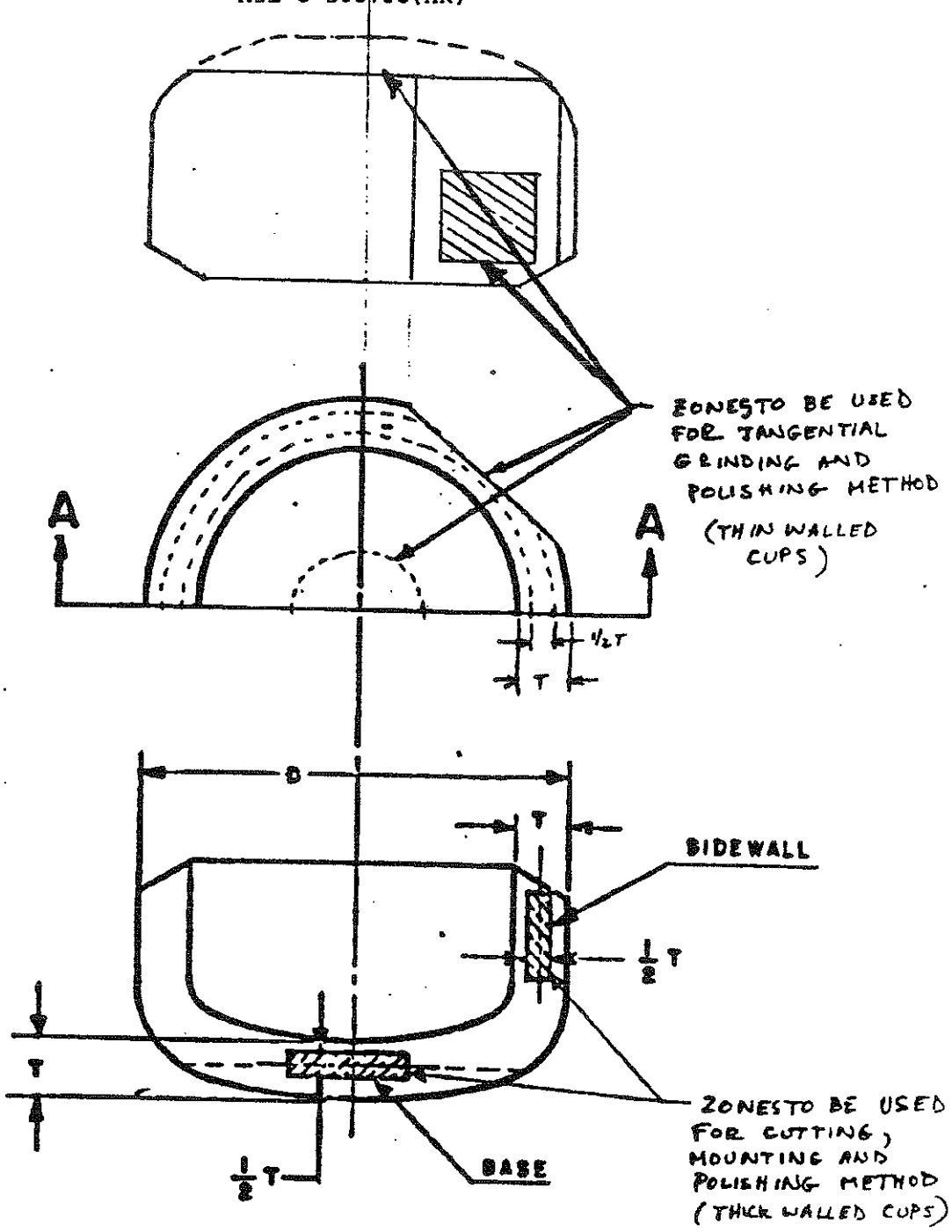
4.5 Methods of inspection.

4.5.1 Grain size. A sample of 15 cups shall be tested for grain size. Failure of two (2) or more cups to comply with the applicable requirements of 3.3 shall be cause for rejection of the lot. If one cup fails in the first test, a second sample consisting of double the number of cups in the first sample shall be tested. If any cups in the second sample fail to comply with the applicable requirements, the lot shall be rejected. The test shall be conducted using the Linear Intercept (Heyn) Method in accordance with Section 11 of ASTM-E112. Grain size measurements shall be made in a zone which is the approximate midpoint of the side wall (and base) length and thickness of the cups, as shown in Figure 1. Either tangential grinding and polishing, or cutting, mounting, and polishing methods may be used to reach the zone for grain size measurements. At least three measurements shall be made, averaged and recorded for each grain size determination.

4.5.2 Workability. A sample of 5,000 cups from the first article production sample shall be subjected to a work test to determine compliance with the processing requirement specified in 3.1. The test shall comprise all the operations in the manufacture of the appropriate cartridge case.

5. PACKAGING

5.1 Packing and marking. The cups shall be packed and marked in accordance with the applicable Special Packaging Instructions: P5203372, P5203381, P10521301, P10522459, P10542547, or P11828914.



VIEW A-A
ZONE TO BE EXAMINED FOR GRAIN SIZE IN CUPS

FIGURE 1

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 cups covered by this specification are intended for use in 5.56mm, 7.62mm and cal .50 cartridges.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number and date of this specification.

b. Drawing number of cup.

c. Packaging Instructions drawing number.

d. Provision for the anneal state of the cups, i.e. annealed per applicable drawing or unannealed.

e. Provision for submission of acceptance inspection reports, in duplicate, to the contracting office, containing final inspection results for each lot of cups presented to the Government.

f. Provisions for performance of work test. Where feasible, the work test portion of the initial production sample shall be forwarded to the facility designated to receive the procured cups. That facility shall perform the work test using tools, drawing compounds, etc., in accordance with that facility's manufacturing process. The balance of the above initial production sample shall be forwarded to a Government approved facility for inspection. The work test shall not be performed until the acceptability of the cups have been determined in the inspection phase and instructions have been issued by the Government to proceed with the test. In those instances are being procured for delivery to multiple consignees, provisions of 4.3.1 shall apply.

6.3 Cup certification. The supplier shall certify that each lot of cups is free of all traces of dichromate, and is coated with a residual film of neutral soap.

6.4 Submission of inspection equipment for design approval. Submit designs as required to: Commander, U.S. Army Armament, Research, Development, and Engineering Center, Picatinny Arsenal, NJ 07806-5000, ATTN: AMSMC-QAF-I (D). This address will be specified on the contract Data Requirements List, DD Form 1423 in the contract.

6.5 Drawings. Drawings listed in Section 2 of this specification under heading U.S. Army Armament Research, Development and Engineering Center (ARDEC) may also include drawings prepared by, and identified as, Edgewood Arsenal, Frankford Arsenal, Rock Island Arsenal, ARDC, ARRADCOM or Picatinny Arsenal drawings. Technical data originally prepared by these activities is now under the cognizance of ARDEC.

6.6 Submission of alternative inspection provisions. Proposed alternative inspection provisions should be submitted by the contractor to the procuring contracting officer for evaluation and approval by the technical activity responsible for preparation of this specification.

6.7 Subject term (Key word) listing.

Cartridge case cups;
small arms ammunition.

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

Custodian
Army-AR

Preparing activity
Army-AR

(Project 1305-AD77)