

INCH-POUND

MIL-A-3816F  
 5 November 1992  
 SUPERSEDING  
 MIL-A-3816E  
 20 September 1976

## MILITARY SPECIFICATION

### ABRASIVES AND ABRASIVE PRODUCTS; PACKAGING OF

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

#### 1. SCOPE

1.1 Scope. This specification covers the requirements and examinations for the preservation, packing and marking of all common types of abrasives and abrasive products for shipment and storage.

#### 2. APPLICABLE DOCUMENTS

##### 2.1 Government documents.

2.1.1 Specifications, standards and handbooks. The following specifications, standards and handbooks form a part of this document to the extent specified herein. Unless 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 6.1).

#### SPECIFICATIONS

##### FEDERAL

A-A-881	- Bags, Shipping, Burlap
UU-C-282	- Chipboard
UU-P-268	- Paper, Kraft, Wrapping
PPP-B-576	- Boxes, Wood Cleated, Veneer, Paper Overlaid
PPP-B-585	- Boxes, Wood Wirebound
PPP-B-591	- Boxes, Fiber Board, Wood-Cleated
PPP-B-601	- Boxes-Wood, Cleated-Plywood
PPP-B-621	- Boxes, Wood, Nailed and Lock-Corner
PPP-B-636	- Boxes, Shipping, Fiberboard

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 PACK

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- PPP-B-640 - Boxes, Fiberboard, Corrugated, Triple-Wall
- PPP-B-665 - Boxes, Paperboard, Metal Edged and Components
- PPP-B-1055 - Barrier Material, Waterproof, Flexible
- PPP-C-96 - Cans, Metal, 28 Gage and Lighter
- PPP-C-843 - Cushioning Material, Cellulosic
- PPP-D-723 - Drums, Fiber
- PPP-F-320 - Fiberboard, Corrugated and Solid, Sheet Stock (Container Grade), and Cut Shapes
- PPP-P-291 - Paperboard, Wrapping and Cushioning
- PPP-T-76 - Tapes, Packaging, Paper (for Carton Sealing)

## MILITARY

- MIL-P-116 - Preservation Methods of

## STANDARDS

## MILITARY

- MIL-STD-109 - Quality Assurance Terms and Definitions
- MIL-STD-129 - Marking for Shipment and Storage
- MIL-STD-147 - Palletized Unit Loads

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

2.2 Non-Government publications. The following document forms 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 cited in the solicitation (see 6.2).

## AMERICAN SOCIETY FOR TESTING AND MATERIALS

- ASTM-D3951 - Commercial Packaging, Standard Practice for (DOD adopted)

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

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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 shall take precedence. Nothing in this document, however, supersedes applicable laws and regulation unless a specific exemption has been obtained.

## 3. REQUIREMENTS

3.1 Materials. Materials used in packing and preservation of abrasives shall conform to the applicable specifications listed herein.

3.2 Separators. Disks or sheets of corrugated fiberboard or chipboard shall be used to protect the side surfaces of grinding wheels, shaped sheets, fragile shapes, or other bonded or coated products where applicable. Disks with cutouts in which the cutout area does not exceed 45 percent of the total disk are acceptable. Separators shall be of adequate size and correct shape to give the required protection to abrasive surfaces. Fiberboard shall conform to PPP-F-320. Chipboard shall conform to UU-C-282.

3.3 Cushioning material. Cellulosic material used for cushioning material shall conform to Type II, Class A of PPP-C-843. Cushioning material shall prevent movement within packs and prevent damage to the items.

3.4 Grinding wheels and special shapes.

3.4.1 Preservation. Preservation shall be Level A or B, or commercial, in unit and intermediate quantities as specified (see 6.1).

3.4.1.1 Level A.

3.4.1.1.1 Cleaning. Cleaning shall be in accordance with any applicable process of MIL-P-116.

3.4.1.1.2 Drying. Drying shall be in accordance with any applicable process of MIL-P-116.

3.4.1.1.3 Preservative application. Exposed, unpainted metal surfaces, except lead or other noncorrosive bushings, mandrels, or accessories, shall be coated with preservative conforming to Type P-19 of MIL-P-116.

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3.4.1.1.4 Unit pack.

3.4.1.1.4.1 Wheels. The unit pack for wheels shall be in accordance with Method III of MIL-P-116. Small wheels, plain, 1.00 inch and under in diameter should be bulk packed (see 6.1). Wheels over 1.00 inch diameter shall be assembled into stacks by placing wheels over one another on their side surfaces. Stacks will not exceed 6.00 inches in height. When vitreous wheels 6.00 through 20.00 inches in diameter and 0.38 inch or less in thickness are assembled in stacks, separators (see 3.2) shall be used between the wheels. Organic-bonded wheels 0.19 inch thick or less shall be assembled into stacks by placing one wheel over another on their side surfaces and cross taped to hold them securely in place. The unit containers for all wheels shall conform to Class - Weather resistant, PPP-B-636 fiberboard box. Closure shall be as specified in 3.4.1.1.5. For cones, plugs and other special shapes, see 3.4.1.1.4.2.

3.4.1.1.4.2 Special shapes. Unless otherwise specified (see 6.1), the unit pack for special shapes shall be in accordance with Method III of MIL-P-116. Stones, sticks and bricks shall be wrapped in bundles, not to exceed 10 pounds, with waterproofed barrier conforming to C-1 of PPP-B-1055, secured with tape conforming to PPP-T-76. Bonded or coated items shall be provided with separators (see 3.2).

3.4.1.1.4.3 Mounted wheels. Mounted wheels shall be provided waterproofed protection. Methods IC-2, I or III of MIL-P-116 shall be utilized, as applicable. Methods I or III, utilizing a weather-resistant fiberboard box, shall be closed by sealing all seams and joints with a water resistant tape.

3.4.1.1.4.3.1 Mounted wheels (straight faced). Straight faced mounted wheels shall be individually boxed. Units weighing up to and including 10 pounds shall be placed in paperboard or fiberboard boxes conforming to Class 2 of PPP-B-665 or Class - Weather resistant of PPP-B-636. Wheels weighing over 10 pounds but not exceeding 50 pounds each shall be cushioned with cellulosic material (see 3.3.) and placed into fiberboard boxes conforming to Class - Weather resistant of PPP-B-636. Closure shall be in accordance with the method of preservation or as specified herein. Wheels weighing in excess of 50 pounds shall be cushioned as required and packed directly into shipping containers (see 3.4.2).

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3.4.1.1.4.3.2 Mounted wheels (sharp edge). Sharp edge mounted wheels shall be individually wrapped and boxed. Units weighing up to and including 2 pounds shall be wrapped in paperboard cushioning PPP-P-291, Type III, and placed in paperboard boxes conforming to Class 2 of PPP-B-665. Wheels weighing over 2 pounds but not exceeding 10 pounds shall be wrapped in paperboard cushioning, PPP-P-291, Type III, and placed in fiberboard boxes conforming to Class - Weather resistant of PPP-B-636 with a liner fabricated from fiberboard conforming to Type CF, Grade 500 of PPP-F-320, around inside of container. Closure shall be in accordance with the method of preservation or as specified herein. Wheels weighing over 10 pounds but not exceeding 50 pounds shall be placed in boxes as above except the liner shall be constructed from two thicknesses of fiberboard conforming to Type CF, Grade 500 of PPP-F-320. Wheels weighing in excess of 50 pounds shall be cushioned, as required, and packed directly into shipping containers (see 3.4.2).

3.4.1.1.5 Intermediate pack. Grinding wheels and special shapes, not exceeding 10 pounds, which were placed in paperboard boxes or wrapped with waterproof paper, shall be placed in boxes (intermediate pack) conforming to Class - Weather resistant of PPP-B-636. Unless otherwise specified (see 6.1), closure shall be accomplished using two strips of 2.00 inches width tape conforming to PPP-T-76. Tape shall be applied on the top and bottom seams. If the bottom of the container is closed with staples or adhesive (or a Style OPF container is used) only a single piece of tape on the top seam is required.

3.4.1.2 Level B.

3.4.1.2.1 Cleaning. Cleaning, drying and preservative application shall be the same as specified for Level A (see 3.4.1.1).

3.4.1.2.2 Unit pack. The unit pack shall be the same as specified for Level A (see 3.4.1.1) except that wrapping paper shall conform to Grade B, 60 pounds, of UU-P-268.

3.4.1.2.3 Intermediate pack. The intermediate pack shall be the same as specified for Level A (see 3.4.1.1.5).

3.4.1.3 Commercial. Preservation shall be in accordance with ASTM-D3951.

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3.4.2 Packing. Packing shall be Level A or B, or commercial, as specified (see 6.1).

3.4.2.1 Level A. Grinding wheels and special shapes preserved as specified in 3.4.1 shall be packed in boxes conforming to one of the following specifications:

PPP-B-585	-	Class 3
PPP-B-601	-	Overseas Type
PPP-B-621	-	Class 2

Unless otherwise specified (see 6.1), the gross weight shall not exceed 200 pounds. Closure and reinforcement shall be accomplished in accordance with the appendix to the applicable box specifications.

3.4.2.2 Level B. Level B packing shall be the same as specified for Level A (see 3.4.2.1) except boxes shall conform to one of the following specifications:

PPP-B-576	-	Class 1
PPP-B-585	-	Class 2
PPP-B-591	-	Class 2
PPP-B-601	-	Domestic Type
PPP-B-621	-	Class 1
PPP-B-636	-	Class Weather Resistant
PPP-B-640	-	Class 2

3.4.2.3 Commercial. Packing shall be in accordance with ASTM-D3951.

### 3.5 Grain abrasives.

3.5.1 Preservation. Preservation shall be Level A or B, or commercial, to unit quantities by weight, as specified (see 6.1).

#### 3.5.1.1 Level A.

3.5.1.1.1 Cleaning. Not applicable.

3.5.1.1.2 Drying. Not applicable.

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3.5.1.1.3 Preservation application. Not applicable.

3.5.1.1.4 Unit pack. The unit pack container for grain abrasives shall conform to one of the following specifications:

0 to 20 pounds	-	PPP-C-96, Type V, Class 2
21 to 100 pounds	-	A-A-881
101 to 200 pounds	-	PPP-D-723, Type III
Over 200 pounds	-	* Special Containers

\* Special type containers may be authorized by the procuring activity for bulk shipments. Containers shall be water resistant, provide a means of handling (skids, pallets, lifting, eyes etc.) and include dimensional and weight limitations acceptable to the common carrier.

3.5.1.2 Level B. The unit pack shall be the same as specified for Level A except containers utilized shall conform to one of the following specifications:

0 to 20 pounds	-	PPP-C-96, Type V, Class 2
21 to 100 pounds	-	A-A-881
101 to 200 pounds	-	PPP-D-723, Type I
Over 200 pounds	-	* Special Containers

\* Special type containers, - see Level A, 3.5.1.1.4.

3.5.1.3 Commercial. Preservation shall be in accordance with ASTM-D3951.

3.5.2 Packing. Grain abrasives shall be packed Level A or B, or commercial, as specified (see 6.1).

3.5.2.1 Level A. Level A unit containers conforming to PPP-C-96 shall be packed for overseas shipment as specified in the appendix to PPP-C-96. Special type unit containers shall serve as shipping containers.

3.5.2.2 Level B. Level B packing shall be the same as specified for Level A, except metal cans shall be packed for domestic shipment in accordance with the appendix to PPP-C-96.

3.5.2.3 Commercial. Packing shall be in accordance with ASTM-D3951.



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3.6 Coated abrasives.

3.6.1 Preservation. Preservation shall be Level A or B, or commercial in unit and intermediate quantities, as specified (see 6.1).

3.6.1.1 Level A.

3.6.1.1.1 Cleaning. Not applicable.

3.6.1.1.2 Drying. Not applicable.

3.6.1.1.3 Preservation application. Not applicable.

3.6.1.1.4 Unit pack.

a. Nonwaterproof disks, belts, rolls, bands, sheets. The unit pack for nonwaterproof disks, belts, rolls and bands shall be in accordance with Method IC-2 of MIL-P-116. The unit pack for sheets shall be in accordance with Method IC-3 of MIL-P-116, utilizing sleeves fabricated from chipboard conforming to UU-C-282.

b. Waterproof disks, belts, rolls, bands, sheets. The unit pack for waterproof disks, belts, rolls, bands and sheets shall be in accordance with Method III of MIL-P-116, utilizing weather resistant containers.

3.6.1.1.5 Intermediate pack. Disks, belts, rolls, bands and sheets in unit packs as specified shall be placed in a fiber-board box conforming to Class - Weather resistant of PPP-B-636. Closure shall be as specified in 3.4.1.1.5.

3.6.1.2 Level B.

3.6.1.2.1 Unit pack. The unit pack shall be the same as specified for Level A, except all packs shall be in accordance Method III of MIL-P-116.

3.6.1.2.2 Intermediate pack. The intermediate pack shall be the same as specified in Level A (see 3.6.1.1.5).

3.6.1.3 Commercial. Preservation shall be in accordance with ASTM-D3951.

3.6.2 Packing. Disks, belts, rolls, bands and sheets shall be packed Level A or B, or commercial, as specified (see 6.1).



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3.6.2.1 Level A. Unit and intermediate packs, as applicable, shall be packed in boxes conforming to one of the following specifications:

PPP-B-585	-	Class 3
PPP-B-601	-	Overseas Type
PPP-B-621	-	Class 2

Unless otherwise specified (see 6.1), the gross weight of boxes shall not exceed 200 pounds. Closure and reinforcement shall be accomplished in accordance with the appendix to the applicable box specification.

3.6.2.2 Level B. Level B packing shall be the same as specified for Level A (see 3.6.2.1), except boxes shall conform to one of the following specifications:

PPP-B-585	-	Class 2
PPP-B-591	-	Class 2
PPP-B-601	-	Domestic Type
PPP-B-621	-	Class 1
PPP-B-636	-	Class Weather Resistant
PPP-B-640	-	Class 2

Unless otherwise specified (see 6.1), the gross weight of fiberboard boxes shall not exceed 120 pounds and triple-wall and wood boxes 200 pounds.

3.6.2.3 Commercial. Packing shall be in accordance with ASTM-D3951.

3.7 Palletized unit loads. When specified (see 6.1), all abrasives covered by this specification shall be shipped as a palletized unit load in accordance with MIL-STD-147.

### 3.8 Marking.

3.8.1 Levels A and B. Unless otherwise specified (see 6.1), interior packs and exterior shipping containers shall be marked in accordance with MIL-STD-129.

3.8.2 Commercial. Marking shall be in accordance with ASTM-D3951.

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## 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 sections 3 and 5. The inspections 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 of defective material. Reference shall be made to MIL-STD-109 to define quality assurance terms used herein.

4.2 Classification of inspections. The inspection requirements specified herein are classified as Quality Conformance inspection (see 4.3).

4.3 Quality conformance inspection.

4.3.1 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 they are 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 an unchanged process, using the same materials and methods, in accordance with, the same drawings, same drawing revisions, same specification and

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same specifications and same specification revisions. 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. The sample unit shall be one container of abrasive products ready for closure.

#### 4.3.2 Examinations 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 system shall provide assurance of compliance of all characteristics with the applicable drawing and specification requirements utilizing as a minimum the conformance criteria specified. When cited herein, attributes sampling inspection shall be conducted in accordance with Table I below, using the inspection levels stated in the Classification of Characteristics paragraphs.

Table I. Attributes sampling inspection

<u>Lot Size</u>	<u>Inspection Levels</u>	
	<u>V</u>	<u>VI</u>
2 to 8	5	3
9 to 15	5	3
16 to 25	5	3
26 to 50	5	3
51 to 90	13	5
91 to 150	13	5
151 to 280	20	8
281 to 500	20	8
501 to 1200	20	13
1201 to 3200	32	13
3201 to 10000	32	13
10001 to 35000	50	13
35001 to 150000	50	13
150001 to 500000	50	13
500001 and over	50	13

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

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b. Alternative quality conformance provisions.

Alternative quality conformance procedures, methods, or equipment, such as statistical process control, tool control, other types of sampling procedures, etc., may be used by the 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 (see 6.3). When required, the contractor shall demonstrate that the effectiveness of each proposed alternative is equal to or better than the specified quality assurance provision(s) herein. In cases of dispute as to whether the contractor's proposed alternative(s) provides equivalent assurance, the provisions of this specification shall apply. All approved alternative provisions shall be specifically incorporated into the contractor's quality program or detailed inspection system, as applicable.

QUALITY CONFORMANCE INSPECTION  
CLASSIFICATION OF CHARACTERISTICS

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PARAGRAPH	TITLE	SHEET 1 OF 1	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	DRAWING NUMBER NA	INSPECTION METHOD REFERENCE
4.3.2.1	Containers of Abrasive Products					
<u>Critical</u>	None defined					
<u>Major</u>						
101.	Improper packaging method used		Level V	3	Visual	
102.	Improper sealing of unit pack		Level V	3	Visual	
103.	Unit and intermediate containers punctured, crushed or torn		Level V	3	Visual	
104.	Omission of stock number		Level V	3	Visual	
105.	Container packing, blocking, partitions, pads and separators missing, crushed or torn.		Level V	3	Visual	
106.	Markings, incorrect or illegible		Level V	3	Visual	
107.	Gross weight exceeded		Level V	3	Visual	
108.	Improper shipping container		Level VI	3	Scale	
109.	Shipping container improperly closed or strapped		Level VI	3	Visual	
110.	Separator disk cut out exceeded		Level VI	3	Visual	
<u>Minor</u>	None defined					

NOTES:

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5. PACKAGING Not applicable

6. NOTES

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

6.1 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number and date of this specification.
- b. Selection of applicable level of protection (A or B), or commercial packaging (see 3.4, 3.5 and 3.6).
- c. Unit pack requirements for special shapes, if other than specified (see 3.4.1.1.4.2).
- d. Closure of intermediate packs, if other than specified (see 3.4.1.1.5).
- e. Quantity per unit and intermediate pack (see 3.4.1, 3.5.1 and 3.6.1).
- f. Gross weight of exterior shipping containers, other than specified (see 3.4.2.1 and 3.6.2.1).
- g. Palletized unit loads, when required (see 3.7).
- h. Special marking, if required (see 3.8.1).
- i. Applicable stock number.
- j. Serialization requirements, if applicable.
- k. Certificate of conformance for each lot of shipment of product.
- l. 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).

6.2 Environmental. Environmental pollution prevention measures are contained in the material specifications referenced herein. Refer to material specifications or preparing activity for recommended disposability methods.

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6.3 Submission of alternative quality conformance provisions. Unless otherwise specified in the contract, proposed alternative quality conformance provisions will be submitted by the contractor for evaluation by the technical activity responsible for the preparation of this specification.

6.4 Subject term (key word) listing

Bricks  
Grinding wheels  
Mounted wheels  
Stones

6.5 Change 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.

Custodians:  
Army - AR  
Navy - SA

Preparing activity:  
Army - AR

Review activity:  
Army - SM

(Project PACK - 0974)



# 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.

**I RECOMMEND A CHANGE:**

1. DOCUMENT NUMBER

MIL-A-3816

2. DOCUMENT DATE (YYMMDD)

5 NOVEMBER 1992

3. DOCUMENT TITLE

ABRASIVES AND ABRASIVE PRODUCTS; PACKAGING OF

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets if 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)

7. DATE SUBMITTED (YYMMDD)

(1) Commercial

(2) AUTOVON (if applicable)

8. PREPARING ACTIVITY

a. NAME  
U.S. ARMY ARDEC  
STANDARDIZATION OFFICE

b. TELEPHONE (Include Area Code)

(1) Commercial  
201-724-6675

(2) AUTOVON  
DSN-880-6675

c. ADDRESS (Include Zip Code)

ATTN: SMACA-BAC-S  
PICATINNY ARSENAL, NJ 07806-5000

IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:

Defense Quality and Standardization Office  
5203 Loosburg Pike, Suite 1403, Falls Church, VA 22041-3466  
Telephone (703) 756-2340 AUTOVON 289-2340