INCH-POUND

MIL-Z-291G
4 December 1992
SUPERSEDING
MIL-Z-291F
18 October 1984

MILITARY SPECIFICATION

ZINC OXIDE, TECHNICAL

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

1. SCOPE

1.1 Scope. This specification covers three grades and two classes of zinc oxide.

1.2 Classification. Zinc oxide shall be of the following grades and classes as specified (see 6.2):

Grade A - Pyrotechnic mixture

Class 1 - Regular grind
Class 2 - Fine grind

Grade B - Stabilizer for XXCC3 impregnite

Class 1 - Regular grind

Grade C - For use as M864 propellant component

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 Chemical Research, Development and Engineering Center, ATTN: SMCCR-PET-S, Aberdeen Proving Ground, MD 21010-5423 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 FSC 6810

2. APPLICABLE DOCUMENTS.

2.1 Government 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 6.2).

SPECIFICATIONS

FEDERAL

NN-P-71	-	Pallets, Material Handling, Wood, Stringer Construction, 2-Way and 4-Way (Partial)
UU-S-48	-	Sacks, Shipping, Paper
PPP-P-704	-	Pails, Metal: (Shipping, Steel, 1 Through 12 Gallons)
PPP-T-60	-	Tape: Packaging, Waterproof

MILITARY

MIL-B-117	-	Bags, Sleeves and Tubing

STANDARDS

FEDERAL

FED-STD-313	-	Material Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities

MILITARY

MIL-STD-129	-	Marking for Shipment and Storage
MIL-STD-147	-	Palletized Unit Loads
MIL-STD-1168	-	Ammunition Lot Numbering
MIL-STD-1233	-	Procedure for Determining Particle Size, Particle Size Distribution, and Packed Density of Powdered Materials

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

2.2 Non-Government publications. The following documents form 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 issue of the documents cited in the solicitation (see 6.2).

ASTM STANDARDS

D 1193	-	Reagent Water
D 1895	-	Apparent Density, Bulk Factor, and Pourability of Plastic Materials
D 3280	-	Analysis of White Zinc Pigments
D 3951	-	Commercial Packaging
E 11	-	Wire-Cloth Sieves for Testing Purposes
E 200	-	Preparation, Standardization, and Storage of Standard Solutions for Chemical Analysis
E 300	-	Sampling Industrial Chemicals

(Application for copies should be addressed to ASTM, 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., Traffic Department, 1616 P Street, NW, 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, IL 60606.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

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 takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Chemical characteristics. Zinc oxide shall conform to the applicable chemical characteristics of table I when tested as specified therein.

TABLE I. Chemical characteristics

Characteristic	Percent by weight			Test paragraph
	Grade A	Grade B	Grade C	
Assay (as ZnO), minimum	98.5	99.0	99.0	4.2.4.1.1
Water soluble salts, maximum	0.50	0.50	0.20	4.2.4.1.2
Lead Oxide (as PbO), maximum	0.60	0.10	0.10	4.2.4.1.3
Loss in weight at 110°C, maximum	0.30	0.50	0.50	4.2.4.1.4
Cadmium (as CdO), maximum	0.20	----	----	4.2.4.1.5
Arsenic (as As_2O_3), maximum	0.10	----	----	4.2.4.1.6
Antimony (as Sb_2O_3), maximum	0.10	----	----	4.2.4.1.6
Chloride (as Cl_2), maximum	----	----	0.005	4.2.4.1.7
Sulfur (as SO_3), maximum	0.40	0.10	----	4.2.4.1.8
Sulfur (as SO_4), maximum	----	----	0.08	4.2.4.1.8

3.2 Particle size.

3.2.1 Class 1. No less than 99.9 percent by weight of class 1 zinc oxide shall pass through a 106-micrometer sieve and no less than 99.0 percent by weight shall pass through a 90-micrometer sieve when tested as specified in 4.2.4.1.9.1.

3.2.2 Class 2. Class 2 zinc oxide shall have an average particle size of no more than 5 micrometers when tested as specified in 4.2.4.1.9.2.

3.2.3 Grade C. No less than 99.0 percent of grade C zinc oxide shall pass through a U.S. Standard sieve No. 325, when tested as specified in 4.2.4.1.9.1.

3.3 Moisture reabsorption. Grade A zinc oxide shall reabsorb no more than 0.54 percent by weight moisture when tested as specified in 4.2.4.1.10.

3.4 Apparent density. Grade A, class 1 zinc oxide shall have an apparent density of no less than 0.75 gram (g) per cubic centimeter when tested as specified in 4.2.4.1.11. The zinc oxide shall meet the apparent density requirement as manufactured. The zinc oxide shall not be reworked after manufacture in order to meet this requirement.

3.5 Material Safety Data Sheets. Material Safety Data Sheets for zinc oxide shall be prepared and submitted by the contractor in accordance with FED-STD-313 (see 6.3).

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 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 Contractor assurance of compliance. The contractor's quality program or detailed inspection system shall provide assurance of compliance of all characteristics with the applicable drawing, special packaging instruction, and specification requirements using, as a minimum, the conformance criteria specified herein.

4.1.3 Alternative inspection provisions. Alternative inspection procedures, methods, or equipment, such as statistical process control, tool control, and other types of sampling procedures may be used by the contractor when they provide, as a minimum, the level of quality assurance required by the inspection 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 6.4.) When required, the contractor shall demonstrate that the effectiveness of each proposed alternative is equal to or better than the quality assurance provisions specified herein. In cases of dispute as to whether the contractor's proposed alternative provides equal quality assurance, the provisions

of this specification shall apply. All approved alternative inspection provisions shall be specifically incorporated into the contractor's quality program or detailed inspection system, as applicable.

4.2 Quality conformance inspection.

4.2.1 Lotting. A lot shall consist of the zinc oxide of one grade and class produced by one manufacturer, at one plant, from the same materials, and under essentially the same manufacturing conditions, provided the operation is continuous. In the event the process is a batch operation, each batch shall constitute a lot (see 6.5). When specified (see 6.2), lot numbering shall be in accordance with MIL-STD-1168.

4.2.2 Sampling.

4.2.2.1 For examination of packaging. Sampling shall be conducted in accordance with table II. The sample unit shall be one filled unit pack or packing container, as applicable.

TABLE II. Sampling for packaging examination and test

Number of containers in batch or lot	Number of sample containers
1 or 2	all
3 to 25	3
26 to 50	5
51 to 90	6
91 to 150	7
151 to 280	10
281 to 500	11
501 to 1,200	15
1,201 to 3,200	18
3,201 to 10,000	22
over 10,000	29

4.2.2.2 For zinc oxide test. See 6.6 for sampling and testing precautions.

4.2.2.2.1 Grades A and B. Sampling shall be conducted in accordance with table III. A representative specimen of approximately 500 g shall be removed from each sample container and placed in a suitable clean, dry container labeled to identify the lot and container from which it was taken.

TABLE III. **Sampling for zinc oxide test grades A and B**

Number of containers in batch or lot	Number of sample containers
1 or 2	all
3 to 25	2
26 to 150	3
151 to 1,200	5
1,201 to 7,000	8
7,001 to 20,000	10
Over 20,000	20

4.2.2.2.2 Grade C. Sampling shall be conducted in accordance with table IV. A representative specimen of approximately 500 g shall be removed from each sample container in accordance with ASTM E 300-73 for solids and labeled to identify the lot and container from which it was taken.

TABLE IV. **Sampling for zinc oxide test grade C**

Number of containers in batch or lot	Number of sample containers
1 or 2	all
3 to 100	2
101 to 200	5
201 to 300	8
301 to 500	10
501 to 1,000	13
1,001 to 3,000	20
3,001 to 10,000	32
over 10,000	40

4.2.2.3 For container leakage test. Sampling shall be conducted in accordance with table II. The sample unit shall be one filled unit pack or packing container, as applicable.

4.2.3 Inspection procedure.

4.2.3.1 For examination of packaging. Sample unit packs and packing containers shall be examined for the characteristics listed below. Failure of any sample unit pack or packing container to conform to all characteristics shall be cause for rejection of the lot represented.

(a) Contents per container
(b) Container
(c) Container closure

(d) Container free of damage
(e) Unitization
(f) Marking evident, correct, and legible

4.2.3.2 For zinc oxide test. (See 6.6 for sampling and testing precautions.) Each sample specimen taken in 4.2.2.2 shall be tested as specified in 4.2.4.1. Failure of any test by any specimen shall be cause for rejection of the lot represented.

4.2.3.3 For container leakage test. The sample containers selected in 4.2.2.3 shall be tested as specified in 4.2.4.2. Failure of any test by any sample unit pack or packing container shall be cause for rejection of the lot represented.

4.2.4 Tests.

4.2.4.1 Zinc oxide tests. Water in accordance with ASTM D 1193 and reagent grade chemicals shall be used throughout the tests. Where applicable, blank determinations shall be run and corrections applied where significant. Tests shall be conducted as follows:

4.2.4.1.1 Assay (as ZnO). Determine the percent by weight zinc oxide in accordance with the total zinc procedure for zinc oxide in ASTM D 3280, using diphenylamine as internal indicator.

4.2.4.1.2 Water-soluble salts. Determine the percent by weight water-soluble salts in the specimen in accordance with the water-soluble salts procedure for zinc oxide in ASTM D 3280.

4.2.4.1.3 Lead oxide. Determine the percent by weight lead oxide in the specimen in accordance with the total lead procedure of ASTM D 3280.

4.2.4.1.4 Loss in weight at 110°C. Weigh to the nearest 0.1 milligram (mg) approximately 4 g of the specimen into a tared covered weighing dish weighed to the nearest 0.1 mg. Remove the cover and heat the dish and contents to constant weight in an oven at 110° ± 2°C. Replace the cover, cool to room temperature and weigh to the nearest 0.1 mg. Calculate the percent loss in weight as follows:

$$\text{Percent loss in weight at } 110°\text{C} = \frac{100\ (A - B)}{W}$$

where A = weight of dish, cover, and specimen before heating in g,
B = weight of dish, cover, and specimen after heating in g,
W = weight of specimen in g.

4.2.4.1.5 Cadmium (as CdO). Weigh to the nearest 0.01 g approximately 5 g of the specimen into a 400-milliliter (mL) beaker. Moisten with water, add 15 mL of concentrated

hydrochloric acid, and evaporate to dryness. Cool, add 10 mL of concentrated sulfuric acid, and heat until sulfur trioxide fumes are expelled. Cool, add 150 mL of water, heat to boiling, and saturate with hydrogen sulfide, cooling the solution towards the end of the precipitation. Filter and wash with cold water. Discard the filtrate. Dissolve the precipitate into the original beaker with 1 to 2 hydrochloric acid and wash with hot water. Evaporate the filtrate almost to dryness, cool, add 10 mL of concentrated sulfuric acid, and heat to fumes of sulfur trioxide. Cool, add 150 mL of water, heat to boiling, and saturate with hydrogen sulfide as before. Three such precipitations are usually necessary to completely remove zinc from the cadmium sulfide. After the final precipitation, filter the cadmium sulfide in a filter crucible weighed to the nearest 0.1 mg. Wash with cold water, alcohol, carbon disulfide and again with alcohol. Dry in an oven at 115° ± 2°C for 1 hour. Cool to room temperature in a desiccator and weigh to the nearest 0.1 mg. Calculate the percent by weight cadmium as (CdO) as follows:

$$\text{Percent cadmium} = \frac{88.8\ (A - B)}{W}$$

where A = weight of crucible and cadmium sulfide in g,
B = weight of crucible in g,
W = weight of specimen in g.

4.2.4.1.6 Arsenic and antimony. Weigh to the nearest 0.01 g approximately 25 g of the specimen into a 600-mL beaker. Add 50 mL of water and dissolve cautiously with 100 mL of concentrated hydrochloric acid. Dissolve approximately 10 g of cuprous chloride in the solution and transfer to a 500-mL distillation flask through a long stem funnel. Rinse the beaker with a small amount of hydrochloric acid. Set up the flask with the side tube bent downwards and connected to a vertical condenser by means of a rubber stopper. Fit the flask with a rubber stopper through which is inserted a thermometer reading from 0° to 150°C in 1-degree intervals, so that the bulb is just below the neck of the flask. Connect the lower end of the condenser to a 500-mL Erlenmeyer flask by means of a rubber stopper which has two additional holes punched in it. Through one of these holes, insert a glass tube which reaches to the bottom of the flask and extends 3 inches above the stopper, and which is open to the air. Through the other hole, insert another glass tube bent so that it will connect the upper part of the flask with the bottom of a 250-mL auxiliary beaker standing near the flask. Add 100 mL of water to the Erlenmeyer flask and 50 mL of water to the auxiliary beaker. Heat the solution to boiling and continue the distillation until the temperature reaches 114°C. Let the solution cool below 100°C, add 50 mL of concentrated hydrochloric acid, and distill until the temperature again reaches 114°C. Stop the distillation, replace the Erlenmeyer flask with another one containing 100 mL of water, and continue distilling until the temperature reaches 150°C. Remove the Erlenmeyer flask and transfer both distillates to 600-mL beakers. Label the first arsenic and the second antimony. Pass a rapid stream of hydrogen sulfide through both solutions for 20 minutes and allow the precipitates to stand for at least 3 hours at a temperature of 40° to 50°C. Filter the solutions through separate filter crucibles weighed to the nearest 0.1 mg, wash

three times with a solution of 1 to 4 hydrochloric acid saturated with hydrogen sulfide, once with methyl alcohol, once with carbon disulfide, and again with alcohol. Dry for 1 hour at 110° ± 2°C, cool to room temperature in a desiccator, and weigh to the nearest 0.1 mg. Calculate the percent by weight arsenic (as As_2O_3) and percent by weight antimony (as Sb_2O_3) as follows:

$$\text{Percent arsenic} = \frac{80.4\ (A - B)}{W}$$

where A = weight of crucible and arsenic precipitate in g,
B = weight of crucible in g,
W = weight of specimen in g.

$$\text{Percent antimony} = \frac{85.8\ (A - B)}{W}$$

where A = weight of crucible and antimony precipitate in g,
B = weight of crucible in g,
W = weight of specimen in g.

4.2.4.1.7 Chloride, grade C only. Weigh to the nearest 0.1 mg approximately 20 g of the specimen into a 500-mL Erlenmeyer flask. Add 200 mL of water and exactly 10 mL of 0.1*N* $AgNO_3$ solution, prepared and standardized in accordance with ASTM E 200. Add 40 mL of concentrated HNO_3 and boil for 25 minutes (all nitrous acid must be removed since it forms a red compound with thiocyanic acid). Cool, add 5 mL $Fe(NO_3)_3$ solution (20 g per 1 L H_2O) and titrate the excess $AgNO_3$ with 0.1*N* NH_4SCN solution, prepared and standardized in accordance with ASTM E 200, to a pink color (the endpoint is obtained from the red color of the soluble ferric thiocyanate formed by the ferric iron in the solution and ammonium thiocyanate). Calculate the percent by weight chloride as follows:

$$\text{Percent chloride (as chlorine)} = \frac{(A \times a) - (B \times b) \times 35.45}{W \times 10}$$

where A = normality $AgNO_3$,
a = volume $AgNO_3$ (10.0 mL),
B = normality NH_4SCN,
b = volume NH_4SCN,
W = weight of specimen used in g.

4.2.4.1.8 Sulfur.

4.2.4.1.8.1 Grades A and B. Determine the percent by weight sulfur in the specimen in accordance with the total sulfur procedure for zinc oxide in ASTM D 3280.

4.2.4.1.8.2 Grade C. Determine the percent by weight sulfur in the specimen in accordance with ASTM D 3280 with the following change:

Substitute 0.412 for the formula factor (instead of 0.343) to obtain an answer as SO_4, percent, where 0.412 is the molecular weight SO_4 (96.07)/molecular weight $BaSO_4$ (233.43).

4.2.4.1.9.1 Particle size, grades A and B, class 1, and grade C. Use sieves conforming to ASTM E 11. Nest the two sieves with the larger mesh sieve on top. Wash 50.0 g of the specimen through the top sieve with a stream of water. (A camel's-hair brush may be used to facilitate washing the particles through the screen.) Rinse the residue with water and then carefully wash the residue into a tared porcelain crucible. Allow the residue to settle, decant any excess water, dry at 105° ± 5°C to constant weight, cool to room temperature in a desiccator, and weigh. Repeat the procedure with the material on the bottom sieve. Calculate the percent by weight specimen passing through each sieve.

4.2.4.1.9.2 Particle size, grade A, class 2. Determine average particle size in accordance with method 100 of MIL-STD-1233.

4.2.4.1.10 Moisture reabsorption. Weigh to the nearest 0.01 g approximately 10 g of the specimen into a glass-stoppered, wide-mouth weighing bottle. Dry to constant weight at 160° ± 2°C, cool to room temperature in a desiccator containing phosphorous pentoxide, and weigh to the nearest 0.1 mg. Place the weighing bottle, with stopper removed, in a second desiccator containing sulfuric acid having a specific gravity of 1.198 at 15°/4°C. (The sulfuric acid may be prepared by adding 180.0 mL of sulfuric acid having a specific gravity of 1.84 to approximately 500 mL of water and diluting to 1 liter with water in a volumetric flask.) Allow the bottle to remain in the desiccator for 24 hours at 25° ± 2°C. Remove the weighing bottle, replace the stopper, and weigh to the nearest 0.1 mg. Calculate the percent by weight moisture reabsorption as follows:

$$\text{Percent moisture reabsorption} = \frac{100\ (A - B)}{W}$$

where A = weight of stoppered bottle and contents after 24 hours in sulfuric acid desiccator in g,
B = weight of stoppered bottle and contents after being dried to constant weight in g,
W = weight of dried specimen in g.

4.2.4.1.11 Apparent density. Determine apparent density in accordance with ASTM D 1895, method A except that the specimen shall be dried to constant weight in an oven at 70° to 75°C prior to testing.

4.2.4.2 Container leakage test. Place the container in each of the following positions, and leave it in each for a period of 15 minutes:

(a) Upright
(b) Upside down
(c) On one side (or one quadrant)
(d) On one end (or second quadrant)
(e) On other side (or fourth quadrant)

Examine the container after each period for any evidence of leakage.

5. PACKAGING

5.1 Unit packing. Zinc oxide shall be unit packed level A, B or commercial as specified (see 6.2).

5.1.1 Level A. A quantity of 50 (+1 or -0) pounds (lb) of zinc oxide shall be unit packed level A in a steel pail furnished with a bag liner. The pail shall conform to type II, class 6 of PPP-P-704 having a nominal capacity of 10 gallons (gal). The bag liner shall conform to type I, class B, style 1 or 2 of MIL-B-117. The bag shall be closed by tying, knotting or heat sealing. The pail shall be tightly closed in accordance with the pail manufacturer's instructions. There shall be no evidence of leakage when the pail is tested as specified in 4.2.4.2.

5.1.2 Level B. A quantity of 50 (+1 or -0) lb of zinc oxide shall be unit packed in a multi-wall paper sack conforming to type optional, construction number 4 or 4X of UU-S-48, utilizing a moisture barrier protection of grade 1 and a wet strength outer wall. If a valve sack is used, the valve of the filled sack shall be made of wet strength paper conforming to the level A requirements of UU-S-48. The tape for seams shall meet the minimum performance requirements of class 1 of PPP-T-60 and shall be a minimum of 2 inches wide.

5.1.3 Commercial. A quantity of 50 (+1 or -0) lb of zinc oxide shall be unit packed in accordance with ASTM D 3951.

5.2 Packing. Zinc oxide, unit packed as specified in 5.1, shall require no further protection for shipment other than unitization.

5.3 Unitization. Uniform quantities of like level A or B packs of zinc oxide shall be palletized in accordance with the applicable requirements for a type III load for pails and strapped type XV load for sacks in MIL-STD-147. The pallet shall conform to type IV, grade B of NN-P-71 for level A packs and to type IV, grade A of NN-P-71 for level B packs. Commercial packs shall be unitized in a manner to assure protection of the packs, acceptance by common carrier and compliance with Uniform Freight Classification Rules, National Motor Freight Classification Rules, and the rules of any other intended mode of transportation.

5.4 Marking. Level A, B, and commercial packs shall be marked in accordance with MIL-STD-129. In addition, each level A, B, and commercial pack shall show the lot or batch number, the date of manufacture of the zinc oxide, and be marked with the following precautionary marking:

RESPIRATORY HAZARD

Do not breath dust.
Breathing dust may cause temporary cold or flu-like symptoms.
Respiratory protection may be required for spill clean up.
Change contaminated clothes.

6. NOTES

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

6.1 Intended use. Grade A, classes 1 and 2 zinc oxide are intended for use in the manufacture of pyrotechnic mixtures. Grade B, class 1 zinc oxide is intended for use as a stabilizer for $XXCC_3$ impregnite. Grade C zinc oxide is intended for use in M864 propellant.

6.2 Acquisition requirements. Acquisition documents must specify the following:

(a) Title, number, and date of this specification
(b) Grade and class of zinc oxide required (see 1.2)
(c) Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see section 2)
(d) If lot numbering in accordance with MIL-STD-1168 is required (see 4.2.1)
(e) Level of unit packing required (see 5.1).

6.3 Material Safety Data Sheets. Contracting officers will identify those activities requiring copies of completed Material Safety Data Sheets prepared in accordance with FED-STD-313. The pertinent mailing addresses for submissions of data are listed in FED-STD-313.

6.4 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.

6.5 Batch. A batch is defined as that quantity of material which has been manufactured by some unit chemical process or subjected to some physical mixing operation intended to make the final product substantially uniform.

6.6 Sampling and testing precautions. This specification requires inspection of chemical material which is potentially hazardous to personnel. This specification does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this specification to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

6.7 Significant places. For the purpose of determining conformance with this specification, an observed of calculated value should be rounded off "to the nearest unit" in the last right-hand place of figures used in expressing the limiting value, in accordance with the rounding-off method of ASTM E 29.

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

6.9 Subject term (key word) listing.

ammonium thiocyanate (NH_4SCN)
antimony (Sb)
antimony trioxide (Sb_2O_3)
arsenic (As)
arsenic trioxide (As_2O_3)
cadmium (Cd)
cadmium oxide (CdO)
carbon disulfide (CS_2)
cuprous chloride (CuCl)
ferric nitrate ($Fe(NO_3)_3$)
hydrochloric acid (HCl)
hydrogen sulfide (H_2S)
lead (Pb)
nitric acid (HNO_3)
silver nitrate ($AgNO_3$)
sulfuric acid (H_2SO_4)
sulfur trioxide (SO_3)
zinc (Zn)

Custodian:

Army - EA
Navy - OS

Review activities:

Army - AR, MD
DLA - GS

Preparing activity:

Army - EA

Project No. 6810-1285

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-Z-2916	2. DOCUMENT DATE (YYMMDD) 921204

3. DOCUMENT TITLE
ZINC OXIDE, TECHNICAL

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as 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) (1) Commercial (2) AUTOVON (If applicable)	7. DATE SUBMITTED (YYMMDD)

8. PREPARING ACTIVITY

a. NAME S. Army Edgewood Research, Development and Engineering Center	b. TELEPHONE (Include Area Code) (1) Commercial (410) 671-3259	(2) AUTOVON DSN 584-3259
c. ADDRESS (Include Zip Code) Tech Dir, U.S. Army ERDEC ATTN: SCBRD-ENE (Std/Specs/Pkg) Aberdeen Proving Ground, MD 21010-5423	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	

DD Form 1426, OCT 89 *Previous editions are obsolete.* 198-290