

O-I-568D

December 4, 1969

SUPERSEDING

Int. Fed. Spec. O-I-00568C(GSA-PSS)

November 19, 1968 and

Fed. Spec. O-I-568B

April 4, 1963

## FEDERAL SPECIFICATION

## INSECTICIDE, DDT (75 PERCENT, WATER-DISPERSIBLE POWDER)

This specification was approved by the Commissioner,  
Federal Supply Service, General Services Administration,  
for the use of all Federal agencies.

## 1. SCOPE

1.1 Scope. This specification covers insecticide, dichlorodiphenyltrichloroethane (DDT), 75 percent, water-dispersible powder, suitable for use, when dispersed in water, as a residual spray for the control of mosquitoes, and fleas.

## 2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of the specification to the extent specified herein.

Federal Specifications:

O-I-514 - Insecticide, DDT  
RR-S-366 - Sieve, Test.  
PPP-C-96 - Cans, Metal, 28 Gage and Lighter.  
PPP-D-723 - Drums, Fiber.  
PPP-P-704 - Pails, Metal: (Shipping, Steel, 1 through 12 Gallon).

Federal Standards:

Fed. Std. No. 123 - Marking for Domestic Shipment (Civilian Agencies).  
Fed. Std. No. 595 - Colors.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

(Single copies of this specification and other Federal Specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Services Administration Regional Offices in Boston, New York, Washington, D.C., Atlanta, Chicago, Kansas City, Mo., Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, Washington.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

Military Standards:

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

(Copies of Military Specifications and Standards required by contractors in connection with specification procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

Laws and Regulations:

Federal Insecticide, Fungicide and Rodenticide Act.

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(The Code of Federal Regulations (CFR) and the Federal Register (FR) are for sale on a subscription basis by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402. When indicated, reprints of certain regulations may be obtained from the Federal agency responsible for issuance thereof.)

**2.2 Other publications.** The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

Uniform Freight Classification Rules.

(Application for copies should be addressed to the Uniform Classification Committee, 202 Union Station, Chicago, Illinois 60606.)

National Motor Freight Classification Rules.

(Application for copies should be addressed to the National Classification Board, 1616 P Street, N. W., Washington, D. C. 20036.)

**3. REQUIREMENTS**

**3.1 Materials.** Insecticide, water-dispersible powder,  $75 \pm 1$  percent DDT, shall be prepared from dichlorodiphenyltrichloroethane (DDT), together with such biologically inert modifying and conditioning agents as are needed to meet the requirements of this specification.

**3.1.1 Dichlorodiphenyltrichloroethane (DDT)** shall conform to the requirements of O-I-514.

**3.2 Finished insecticide.** The finished insecticide shall contain not less than 36 percent by weight of organic chlorine when tested as specified in 4.3.1, shall be free flowing, of a light color such as white, tan, cream, or light gray, and shall be readily wettable with water to provide dispersions suitable for use as residual-effect insecticide sprays.

**3.2.1 Foaming.** Any foam built up in the preparation of test suspensions shall not have such copiousness, stability, or other properties as would prevent the completion of the tests specified herein.

**3.3 Particle size.**

**3.3.1 Average diameter.** The surface-mean particle diameter of the insecticide powder, determined as specified in 4.3.2.1, shall be not greater than 3.0 microns.

**3.3.2 Maximum diameter (under simulated storage conditions conducive to caking).** Not less than 98 percent of the insecticide powder shall pass through a 74-micron (U. S. Standard No. 200) sieve conforming to RR-S-366, in the test as specified in 4.3.2.2.

**3.4 Dispersibility.** Not less than 95 percent of the insecticide powder incorporated in a suspension shall pass through a 74-micron (U. S. Standard No. 200) sieve, conforming to RR-S-366, in the test without pretreatment as described in 4.3.3.3, Test A; and not less than 90 percent shall pass the same sieve in the test with pretreatment, as described in 4.3.3.3, Test B.

**3.5 Reaction.** A suspension prepared and tested as specified in 4.3.4 shall have a pH value not lower than 5.0 and not higher than 10.0. If pH is above 8.0, not more than 8.0 ml. of .25 normal hydrochloric acid shall be required to neutralize the alkalinity of 8.0 gram sample, by titration according to 4.3.4.2.

**3.6 Registration.** The finished insecticide formulation shall be registered with the U. S. Department of Agriculture under the Federal Insecticide, Fungicide and Rodenticide Act.

**3.7 Workmanship.** The product shall be clean, uniform, and free from any defects which might impair its utility.

**4. QUALITY ASSURANCE PROVISIONS**

**4.1 Responsibility for inspection.** Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

#### 4.2 Sampling and inspection.

4.2.1 Inspection. Inspection shall be in accordance with the provisions set forth in MIL-STD-105 except as otherwise specified herein.

4.2.2 Sampling for tests. A lot shall consist of  $20,000 \pm 1,000$  pounds. The Government representative shall take a one pound random sample from each lot offered by the manufacturer. All samples shall be taken from filled shipping containers. The lot shall be unacceptable if the sample fails to meet any test requirement.

4.2.3 Sampling for examination of filled containers. A random sample of filled containers shall be selected from each lot in accordance with MIL-STD-105 at inspection level I and acceptable quality level (AQL) = 2.5 percent defective to verify compliance with all stipulations of this specification regarding fill, closure, marking and other requirements not involving tests.

4.2.4 Examination of preparation for delivery. An examination shall be made to determine that packaging, packing and marking comply with the requirements of section 5. Defects shall be scored as specified in table I. Sampling shall be in accordance with MIL-STD-105. The sample unit shall be one container fully prepared for delivery. The lot shall be the number of containers offered for inspection at one time. The inspection level shall be S-2 with an AQL of 4.0 defects, expressed in terms of defects per hundred units.

TABLE I. Examination of preparation for delivery

Examine	Defects
Containers	Not as specified.
Contents	Not as specified.
Marking	Omitted; incorrect; illegible; improper size, location, sequence or method of application.
Material	Component missing or damaged.
Workmanship	Bulging or distortion of containers, cushioning inadequate, improper or missing.

4.2.5 Examination for classification of defects. The Government reserves the right to require examination for any defect not included herein and to classify such defects in accordance with the definitions contained in MIL-STD-105. The lot size shall be expressed in units of filled containers.

4.2.5.1 Examination of the powder. The two containers selected in accordance with 4.2.3 shall be opened and the powder examined for the following defects:

Not uniform  
 Not acceptable color  
 Not free-flowing  
 Screenings (4.3.2.2.3) show evidence of any rust, hair or vegetable, metallic, or animal matter

TABLE II. Tests for characteristics

Characteristic	Reference to requirements paragraph	Test procedures	Requirements applicable to:		Sample unit
			Sample unit	Lot average	
DDT content	3.1	4.3.1	X		}
Foaming	3.2.1	All applicable tests	X		
Particle size:					} 1 lb.
Average diameter	3.3.1	4.3.2.1	X		
Maximum diameter	3.3.2	4.3.2.2	X		
Dispersibility	3.4	4.3.3	X		
Reaction	3.5	4.3.4	X		}

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### 4.3 Test methods.

4.3.1 DDT content. Weigh a quantity of sample containing about 0.75 gram of DDT, transfer to a 100 -ml. volumetric flask, and add exactly 100 ml. of chlorine- and thiophene-free benzene. Shake well until the DDT is dissolved and the solution is well mixed. Allow to settle and transfer a 10-ml. aliquot to a 250- to 500-ml. standard-taper Erlenmeyer flask. Evaporate on a steam bath until most of the benzene is removed. It is not desirable to evaporate to dryness, as DDT may decompose with loss of hydrochloric acid. Add 25 ml. of 99-percent isopropanol and proceed as directed in that part beginning "Add 2.5 grams of metallic sodium. . ." of paragraph 4.4.2 of O-I-514.

### 4.3.2 Particle size.

4.3.2.1 Average diameter. The surface-mean particle diameter shall be determined by the air-permeation method. The apparatus used shall be a Government-approved air-permeation apparatus (see 6.2). The solid density of the powder, knowledge of which is prerequisite to particle fineness measurement by the air-permeation procedure, may be determined by any standard method. A suitable method is the conventional method of liquid immersion in a specific gravity bottle having a ground-in thermometer, with distilled water as the immersion liquid. In the use of this method, care must be taken to guard against significant loss of water-soluble material; the pycnometer (specific gravity bottle) should have a nominal volume of 25 ml. at least, and the weight of sample used for observation should be as great as can be handled conveniently in the pycnometer used. The density normally is approximately 1.65 grams per cc., and in the absence of contrary evidence, this value may be assumed without determination; in the event of question, however, the density value as determined specifically for the product shall govern.

### 4.3.2.2 Maximum diameter.

#### Apparatus:

- (a) Pretreatment jar; an air-tight screw-cap glass jar, 35 ( $\pm$  5) ml. actual capacity.
- (b) Oven; regulated to maintain 55°C.  $\pm$  1°C.
- (c) Mixing jar; a screw-cap glass jar, 295-300 ml. (10 U. S. fl. oz.), substantially cylindrical, approximately 8 cm. deep, without abrupt shoulders. (Some kinds of conventional fruit jars qualify.)
- (d) Tumbling machine; any mechanical device for rotating the mixing jar around its center, end-over-end, at 60 r.p.m.
- (e) Sieve; a 74-micron (U. S. No. 200) standard testing sieve, 8-inch frame diameter, conforming to RR-S-366.
- (f) Sprayer; consisting of a shower head, with not less than 50 perforations distributed practically uniformly over a circular face-plate area 6-8 cm. in diameter, connected by a hose to a source of tap water. The relation of water pressure to size and number of perforations must be such that if the shower head be inverted to send a spray upward no considerable portion of the spray will rise more than 15 cm. above the face plate. If the pressure as limited by this criterion is insufficient to give the prescribed flow rate (4.3.2.2.3), the flow rate must be adjusted by increasing the size and/or number of perforations.

This test, which is primarily a sieve test designed so that essentially all the material in an acceptable sample will pass through the sieve, involves a pretreatment to simulate storage conditions conducive to caking. The complete test procedure consists of three steps: (1) the pretreatment; (2) the preparation of a suspension of the treated sample in water; and (3) the actual screening and determining the percentage of residue. The three steps shall be performed in the following manner:

4.3.2.2.1 Pretreatment. Store the opened jar and screw-cap at 55°C. for at least a 1-hour period; then, without allowing the jar to cool, pour an 8-gram sample of the powder into the jar, seal the jar air-tight and keep it in the oven at 55 ( $\pm$  1)°C. for 24 hours. Remove from oven and let stand at room temperature, still sealed, for 3 hours; then proceed promptly to preparation of suspension as directed in 4.3.2.2.2.

4.3.2.2.2 Preparation of suspension. (a) Deposit the 8-gram sample of pretreated powder on a 50-ml. portion of distilled water in the mixing jar and let stand for 3 minutes for the powder to sink and/or soak undisturbed. (b) Close the jar and tumble it on the machine at 60 r.p.m. for 5 minutes. (c) Dilute with 185 ml. of distilled water. (d) Tumble as before, for 1 minute, and proceed to 4.3.2.2.3.

4.3.2.2.3 Screening. Transfer the suspension to the sieve, which in preparation for the test must have been freed of any film of grease or other water-repellent material. Wash the residue on the sieve for 10 minutes with the sprayer adjusted to deliver 4-5 liters per minute. Transfer the residue to a filter whose weight has been determined on the oven-dried basis (oven temperature not over 80°C.); dry the residue in an oven at the same temperature as was used for the tare weight; and calculate the weight percentage of sample passing through the sieve.

#### 4.3.3 Dispersibility.

4.3.3.1 Apparatus. Same as for maximum diameter test (4.3.2.2), with omission of sprayer.

#### 4.3.3.2 Reagents.

(a) Hard water; designed to have a hardness of 342 p.p.m. calculated as calcium carbonate; composition as follows:

Calcium chloride anhydrous.	0.3037 gram
Magnesium chloride hexahydrate	0.1383 gram
Distilled water, to make	1 liter

4.3.3.3 Procedure. The dispersibility of the powder in water is tested by a special sieve test in which the suspension is simply poured upon the sieve without any washing or any agitation of the sieve. In preparation for this test, make sure that the wire cloth of the sieve is free from any film of grease or other water-repellent material and is thoroughly wetted with water on both sides and kept so wetted until the moment for use.

#### Test A: Without pretreatment.

Prepare a suspension as in 4.3.2.2.2 except (1) to omit the pretreatment of the powder and (2) to substitute hard water for distilled water throughout. When the final tumbling is completed, remove the jar from the machine, and with the sieve standing in a level position, pour the suspension as evenly as possible over its whole area, taking care meanwhile not to allow any powder to settle in the jar. Raise one side of the sieve frame 25 mm. by means of a prop and allow the residue to drain undisturbed for 5 minutes. Transfer the residue to a filter, dry and weigh as in 4.3.2.2.3, and calculate the dispersibility at 74 microns as weight percentage of sample passing through the sieve. (Filtration may often be facilitated by washing the residue from the sieve into a beaker, adding a few ml. of dilute alum solution to flocculate the solids, then pouring onto a coarse filter.)

#### Test B: With pretreatment.

Procedure is the same as in Test A except that the powder pretreatment (4.3.2.2.1) is included.

#### 4.3.4 Reaction.

4.3.4.1 pH value. Make a suspension in distilled water by the procedure in 4.3.2.2.2 using 8.0 grams of untreated powder. Allow the suspension to stand for 1 hour after preparation; then determine the pH value at 25°C. by any standard means.

4.3.4.2 Titration. Titrate entire suspension from 4.3.4.1 with .25 normal hydrochloric acid, using phenolphthalein as an indicator.

### 5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A, B, or C, as specified (see 6.1).

5.1.1 Level A. Four or five pounds (see 6.1) plus or minus 0.5 ounce of insecticide shall be packaged in a can conforming to FPP-C-96, type V, class 2. Exterior coating plan B and side seam striping are required.

5.1.2 Level B. The insecticide shall be packaged as specified in 5.1.1, except that exterior coating shall be plan A and side seam striping is not required.

5.1.3 Level C. Insecticide, in quantity specified (see 6.1) shall be packaged to afford adequate protection against damage during shipment from the supply source to the first receiving activity.

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

5.2.1 Level A.

5.2.1.1 Four or five pound cans. The cans shall be packed in accordance with the level A requirements for five pounds cans as specified in the appendix of PPP-C-96.

5.2.1.2 Sixteen, twenty, forty and fifty pound quantities. Sixteen, twenty, forty and fifty pounds of insecticide, shall be packed in a pail or drum as described in 5.2.1.2.1 or 5.2.1.2.2, as specified (see 6.1).

5.2.1.2.1 Metal pails. The metal pails shall conform to PPP-P-704, type II, size as applicable. Each pail shall be provided with an interior coating which shall neither affect nor be affected by the products contained therein. Unless otherwise specified (see 6.1) color of exterior coating shall conform to Fed. Std. No. 595, Color No. 24087.

5.2.1.2.2 Fiber drums. The fiber drums shall conform to PPP-D-723, type II or III, grade A. The drums shall be provided with an interior moisture proof coating or polyethylene bag lining which shall neither affect nor be affected by the product contained therein.

5.2.2 Level B.

5.2.2.1 Four or five pound cans. The cans shall be packed in accordance with the level B requirements for five pound cans as specified in the appendix of PPP-C-96.

5.2.2.2 Sixteen, twenty, forty and fifty pound quantities. Sixteen, twenty, forty and fifty pounds of insecticide, as specified (see 6.1), shall be packed in a pail or drum as described in 5.2.2.2.1 or 5.2.2.2.2, as specified (see 6.1).

5.2.2.2.1 Metal pails. The metal pails shall conform to PPP-P-704, type II, size, as applicable. Each pail shall be provided with an interior coating which shall neither affect nor be affected by the product contained therein. Commercial exterior colors are acceptable.

5.2.2.2.2 Fiber drums. The fiber drums shall conform to PPP-D-723, type I or type II grade A. The drums shall be provided with an interior moisture proof coating or polyethylene lining which shall neither affect nor be affected by the product contained therein.

5.2.3 Level C. Insecticide packaged in quantities as specified (see 6.1) shall be packed in containers to assure carrier acceptance and safe arrival at destination in compliance with Uniform Freight Classification Rules or National Motor Freight Classification Rules.

5.3 Labeling and marking. The labeling and marking shall comply with the Federal Insecticide, Fungicide and Rodenticide Act and Regulations promulgated thereunder. In addition to any special marking required by the contract or order, marking of the interior containers and exterior shipping containers shall be in accordance with Fed. Std. No. 123 for civil agencies or MIL-STD-129 for military agencies, as applicable (see 6.1).

6. NOTES

6.1 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

- (a) Title, number, and date of this specification.
- (b) Level of packaging and packing required (see 5.1 and 5.2).
- (c) Quantity to the container (see 5.1.1, 5.1.3, 5.2.1.2, 5.2.2.2 and 5.2.3).
- (d) Kind of container desired (see 5.2.1.2 and 5.2.2.2).
- (e) Whether a different color of pail is desired (see 5.2.1.2.1 and 5.2.2.2.1).
- (f) Required marking document (see 5.3).

6.2 Air permeation apparatus. An approved apparatus is the self-calculating air-permeation apparatus of the U. S. Department of Agriculture (Patent No. 2, 261,802), or equal. The Sub-Sieve Sizer, manufactured by the Fisher Scientific Company, or equal, may be used as the test instrument. Each individual apparatus is subject to inspection by the purchasing agency as a check on calibration and performance.

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MILITARY CUSTODIANS:

Army - MJ (EA)  
Navy - YD  
Air Force - 68

Review activation:

Army - MJ (EA), GL, MD, CE  
Navy - YD, MS  
Air Force - 68  
DSA-DGSC

User activation:

Army - SM, ME  
Navy - SH

CIVIL AGENCY INTEREST:

VA  
DC GOV  
AGR

Preparing activity:

GSA-FSS

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**SPECIFICATION COMMENT SHEET**

BUDGET BUREAU NO.

29-R0175

**INSTRUCTIONS**

This form provides a way for users of this specification to inform the originator of problems encountered in its use. It is not to be used to request changes to accommodate proprietary features. All comments will be considered and appreciated, but please do not expect a reply. To comment: detach, complete, fold, staple, and mail.

NOTE: Comments on this form do not constitute or imply authorization to waive any part of the document or serve to amend contractual requirements.

**1. SPECIFICATION**

O-I-568D - Insecticide, DDT (75 Percent, Water Dispersible Powder)

**2. CONTRACT NO. (If any)****3. QUANTITY ON CONTRACT (Optional)****4. DOLLAR VALUE (Optional)****5. GENERAL NATURE OF PROBLEM (e.g., inspection difficulties, manufacturers unable to meet tolerances, containers collapse under normal warehousing conditions, etc.)****6. SPECIFIC REQUIREMENTS AFFECTED (Include paragraph number and lines of wording)****7. SPECIFIC PROBLEMS (e.g. tests in 4.2.2 will not assure that the battery will last required time; temperature ranges in table 2 do not conform to commercially available items.)****8. RECOMMENDATIONS****9. NAME OF MANUFACTURER, ASSOCIATION, GOVT., AGENCY, ETC.****10. ADDRESS (Number, Street, City, State and Zip Code)****11. NAME AND TITLE OF SUBMITTER****12. DATE**