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SUPERSEDING
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FEDERAL SPECIFICATION

INSECTICIDE, MALATHION, EMULSIFIABLE CONCENTRATE

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers two classes of an emulsifiable concentrate containing malathion insecticide.

1.2 Classification. The emulsifiable concentrate shall be of the following classes as specified (see 6.2):

Class 1 - For indoor use.
Class 2 - For outdoor use.

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 this specification to the extent specified herein:

Federal Specifications:

TT-V-121 - Varnish, Spar, Water-Resisting.
VV-F-800 - Fuel Oil, Diesel.
MMM-A-178 - Adhesive, Paper Label, Water-Resistant.
PPP-B-601 - Boxes, Wood, Cleated-Plywood.
PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner.
PPP-B-636 - Boxes, Shipping, Fiberboard.
PPP-D-729 - Drums, Shipping and Storage, Steel, 55-Gallon (208 Liters)
PPP-F-320 - Fiberboard; Corrugated and Solid, Sheet Stock (Container Grade), and Cut Shapes.
PPP-P-704 - Pails, Metal: (Shipping, Steel, 1 Through 12 Gallons).

Federal Standards:

Fed. Test Method Std. No. 101 - Preservation, Packaging, and Packing Materials: Test Procedures.
Fed. Std. No. 123 - Marking for Shipment (Civil Agencies).

(Activities outside the Federal Government may obtain copies of Federal specifications, standards, and commercial item descriptions as outlined under General Information in the Index of Federal Specifications, Standards and Commercial Item Descriptions. The Index, which includes cumulative bimonthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, US Government Printing Office, Washington, DC 20402.

(Single copies of this specification, other Federal specifications, and commercial item descriptions required by activities outside the Federal Government for bidding purposes are available without charge from General Services Administration Business Service Centers in Boston; New York; Washington, DC; Philadelphia; Atlanta; Chicago; Kansas City, MO; Fort Worth; Houston, Denver; San Francisco; Los Angeles; and Seattle, WA.

(Federal Government activities may obtain copies of Federal specifications, standards, and commercial item descriptions, and the Index of Federal Specifications, Standards and Commercial Item Descriptions from established distribution points in their agencies.)

Military Specifications:

MIL-C-17504 - Coating Compound, Acrylic, Clear.
DOD-I-51064 - Insecticide, Malathion (Metric).

Military Standards:

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129 - Marking for Shipment and Storage.
MIL-STD-147 - Palletized Unit Loads for 40" by 48" Pallets.
MIL-STD-1188 - Commercial Packaging of Supplies and Equipment.

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

Code of Federal Regulations (CFR):

40 CFR 162 - Regulations for the Enforcement of the Federal Insecticide, Fungicide, and Rodenticide Act.
49 CFR 171 to 179 - Hazardous Materials Regulations.

(The Code of Federal Regulations and the Federal Register (FR) are for sale on a subscription basis by the Superintendent of Documents, US Government Printing Office, Washington, DC 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.

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.)

American Society for Testing and Materials (ASTM) Standards:

D 86 - Distillation of Petroleum Products.
D 287 - API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method).
D 1193 - Reagent Water.
D 1310 - Flash Point of Liquids by Tag Open-Cup Apparatus.
D 1500 - ASTM Color of Petroleum Products (ASTM Color Scale).
D 1533 - Water in Insulating Liquids (Karl Fischer Method).
E 70 - pH of Aqueous Solutions with the Glass Electrode.

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

American Chemical Society (ACS) Publication:

Reagent Chemicals, American Chemical Society Specifications

(Application for copies should be addressed to the American Chemical Society, 1155 Sixteenth Street, N.W., Washington, DC 20036.)

3. REQUIREMENTS

3.1 Composition. The emulsifiable concentrate shall be a solution of malathion insecticide, an emulsifying agent, and a solvent.

3.1.1 Malathion insecticide. The malathion insecticide used to produce class 1 emulsifiable concentrate shall conform to grade A of DOD-I-51064. The malathion insecticide used to produce class 2 emulsifiable concentrate shall conform to grade B of DOD-I-51064.

3.1.2 Emulsifying agent. The emulsifying agent used to produce the emulsifiable concentrate shall be completely soluble in it and shall be stable in the presence of malathion insecticide.

3.1.3 Solvent. The solvent used to produce the emulsifiable concentrate shall be an aromatic petroleum derivative conforming to the characteristics of table I when tested as specified therein.

TABLE I. Characteristics of solvent

Characteristic	Requirement	Test method
Flash point, minimum	140°F (60°C)	ASTM D 1310
Distillation range:		
Initial boiling point, minimum	302°F (150°C)	ASTM D 86
Dry point, maximum	590°F (310°C)	ASTM D 86
ASTM color, maximum	2.0	ASTM D 1500
Degrees API at 60°F(16°C)	9 to 22	ASTM D 287

3.2 Appearance. The emulsifiable concentrate shall be a clear, homogeneous solution which is free from foreign matter when tested as specified in 4.2.4.1.

3.3 Malathion content. The emulsifiable concentrate shall contain no less than 54.6 percent by weight malathion when tested as specified in 4.2.4.2.

3.4 Emulsion stability. The emulsifiable concentrate shall form stable 5-percent emulsions in both hard water and soft water and the emulsions shall have no oil separation and no more than 1 milliliter (ml) of creamy layer separation when tested as specified in 4.2.4.3.

3.5 Color. The emulsifiable concentrate shall have a color no greater than 2.0 when tested as specified in 4.2.4.4.

3.6 pH of aqueous emulsion. The pH of a 5-percent aqueous emulsion of the emulsifiable concentrate shall be no less than 2.5 and no greater than 7.0 when tested as specified in 4.2.4.5.

3.7 Water content. The emulsifiable concentrate shall contain no more than 0.2 percent by weight water when tested as specified in 4.2.4.6.

3.8 Iron content. The emulsifiable concentrate shall contain no more than 15 parts per million (ppm) iron when tested as specified in 4.2.4.7.

3.9 Compatibility with diesel fuel oil. A 5-percent solution of emulsifiable concentrate in diesel fuel oil shall show no evidence of phase separation or sedimentation when tested as specified in 4.2.4.8.

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 as specified herein. Except as otherwise specified in the contract or 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 the specification where such inspections are deemed necessary to assure supplies and services conform to specified requirements.

4.2 Quality conformance inspection.

4.2.1 Lotting. A lot shall consist of the emulsifiable concentrate produced by one manufacturer, at one plant, from the same lots of materials, and under essentially the same manufacturing conditions.

4.2.2 Sampling.

4.2.2.1 For examination of preparation for delivery. Sampling shall be conducted in accordance with MIL-STD-105.

4.2.2.2 For emulsifiable concentrate test. Sampling for test shall be conducted in accordance with table II. A representative specimen of approximately 1 liter 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 II. Sampling for test

Number of unit containers in lot	Number of sample unit containers
2 to 25	2
26 to 150	3
151 to 1,200	5
Over 1,200	8

4.2.2.3 For container leakage test. Sampling shall be conducted in accordance with MIL-STD-105.

4.2.3 Inspection procedure.

4.2.3.1 For examination of preparation for delivery. The sample unit shall be one filled unit or shipping container, as applicable. Sample containers selected in accordance with 4.2.2.1 shall be examined for the following defects using an AQL of 1.5 percent defective:

(a) Contents per container not as specified
(b) Container not as specified
(c) Container closure not as specified
(d) Container damaged or leaking
(e) Container two-coat lining missing or not as specified
(f) Fiberboard partitions or pads missing, incorrectly positioned, or not as specified (where required)
(g) Marking incorrect, missing or illegible*
(h) Labeling incorrect, missing, or illegible*
(i) Labels not entirely affixed to container*

*Examine after the container marking and labeling has been covered with water at a temperature of 24° ± 3°C for 4 hours and then dried.

4.2.3.2 For emulsifiable concentrate test. Each sample specimen taken in 4.2.2.2 shall be tested as specified in 4.2.4. 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 unit shall be one container. The sample containers selected in 4.2.2.3 shall be tested as specified in 4.2.5 using inspection level S-4 and an AQL of 1.5 percent defective.

4.2.4 Emulsifiable concentrate tests. Water, in accordance with ASTM D 1193, and reagent grade chemicals shall be used throughout the tests. Reagent chemicals shall comply with Reagent Chemicals, American Chemical Society Specifications when listed therein. Where applicable, blank determinations shall be run and corrections applied where significant. Tests shall be conducted as follows:

4.2.4.1 Appearance. Visually examine the specimen for clarity, homogeneity, and the presence of foreign matter.

4.2.4.2 Malathion content (see 6.4).

(a) Preparation of internal standard solution. Prepare a 1.2 percent weight per volume solution of m-diphenoxybenzene in chloroform. This solution is stable for 4 weeks if it is kept tightly sealed and under refrigeration. Allow the solution to warm to room temperature before use.

(b) Preparation of standard malathion solutions. Weigh accurately about 170, 200, and 230 milligram (mg) quantities of malathion of known purity into separate preweighed 25-milliliter (ml) volumetric flasks. Add by volumetric pipet exactly 5 ml of the internal standard solution prepared in (a) to each flask. Dilute to the volume mark with chloroform. Label the three standard solutions "A", "B", and "C", respectively. Solution B is the working standard solution for gas chromatography; solutions A and C are used to check linearity of the gas chromatograph. These solutions are stable for 4 weeks if they are kept tightly sealed and under refrigeration. Allow the solutions to warm to room temperature before use.

make 1 liter.

(c) Preparation of gas chromatography column. Weigh 6.25 gram (g) of "SP 2401" or "OV 210" into a 250-ml beaker and dissolve in 125 ml of ethyl acetate. Stir the solution to obtain a vortex and add 25 g of the solid support material with continued agitation. Filter the slurry through a Buchner funnel using a No. 1 Whatman paper and a gentle vacuum to minimize solvent loss through evaporation. Continue filtration until the drop rate is approximately one per second. Transfer the packing to a "HI-EFF Fluidizer" or equivalent apparatus and dry the packing with a low flow of heated nitrogen by connecting a source of nitrogen through a pressure reducer to the base of the fluidizer and by placing the fluidizer on a controlled temperature hot plate set at 75°C. Continue the drying procedure until solvent vapors can no longer be detected. Take care that the packing is not blown out of the top of the fluidizer.

(d) Column conditioning. Condition the column for 15 hours at 255°C or approximately 20°C below the maximum temperature recommended for the liquid phase. This step should be conducted with the exit end of the column unconnected to the detector but with the carrier gas flowing at the recommended rate. Connect the exit end of the column to the detector and set the control to provide the conditions listed in table III. Allow the instrument to come to equilibrium and then inject 3-microliter aliquots of the solution C prepared in (b) into the chromatograph until constant response is obtained (at least three consecutive injections for which the response ratios agree to within 2 percent).

(e) Gas chromatograph. Use a gas chromatograph having a high sensitivity flame ionization detector and an electrometer having a sensitivity of at least 10^{-11} amperes driving a 1 millivolt recorder and having a drift of less than 1 percent per hour. It must have an on-packing injection system and an all-glass column. An electronic digital integrator or computer-based area measurements must also be used. The integrator should have independent controls for the selection of up and down slope sensitivities so that start and stop integration points can be selected.

(f) Chromatographic conditions. Recommended conditions for a Hewlett-Packard Model 7600 gas chromatograph are shown in table III. Other equivalent instrumentation may be used but may require modification of conditions in order to obtain good peak shape, adequate resolution, and appropriate retention times.

(g) Linearity check. Check the gas chromatograph for linearity at least weekly, whenever new standard solutions are prepared, and whenever the column, new or used, is newly installed in the instrument. Employing digital integration for peak area measurements, determine the appropriate setting and injection aliquot (between 2 and 4 microliters) of standard solution B to yield an area count of at least 100,000 counts (optimum electrometer output with acceptable noise level). Use the conditions so determined for all specimens and standards in the set. Inject triplicate aliquots of the determined appropriate volume of standard solutions A, B, and C into the chromatograph, determine the response ratio for each injection, and average the resulting

ratios for each solution. Divide the average response ratio for each solution by the corresponding malathion content in milligrams and compare the resulting factors. These factors should agree to within 2 percent. Factors not within 2 percent indicate either a weighing error in the preparation of one of the standard solutions or instrumental difficulties which must be corrected before proceeding with an analysis of the specimen.

TABLE III. Chromatographic conditions (see 6.4)

Characteristic	Condition
Range	1000
Column dimensions	122 cm by 4 mm ID (6 mm OD)
Column material	Borosilicate glass
Column support	100 to 120 mesh "Gas Chrom Q" or "Supelcoport"
Column coating	5 percent "SP 2401" or "OV 210"
Oven temperature	180°C
Injection port temperature	200°C
Flame detector temperature	300°C
Gas flow rates, ml per minute:	
Helium (carrier gas)	30
Hydrogen	35
Air	425
Integrator settings:	
Noise suppression	Maximum
Slope sensitivity up	0.1
Slope sensitivity down	0.1
BL reset delay	0.15
Area threshold	1000
Retention times, minutes:	
Malathion peak	10
Internal standard peak	6
Minimum time between malathion and internal standard peaks	3.5

NOTE: Integrator settings should be adjusted so that the deflections on the slope meter do not exceed ± 50 percent before injection.

(h) Procedure. Weigh accurately an amount of specimen containing about 200 mg of malathion into a preweighed 25-ml volumetric flask. Add by pipet exactly 5 ml of m-diphenoxybenzene to each of the volumetric flasks in the set. Dilute to the volume mark with chloroform and mix well. Inject duplicate aliquots of the appropriate volume determined in (g) of standard solution B. The response ratios should agree to within 2 percent. If the precision limit is not met, inject two more aliquots of standard solution B. Failure to meet the precision requirement with the second pair of injections indicates instrumental difficulties which must be resolved before proceeding with the

analyses. Inject duplicate aliquots (of the same volume as used in the preceeding step) of each of the specimen solutions. The precision considerations discussed in the preceeding step also apply here. Average the duplicate ratios for each specimen solution. After every two specimen solutions, inject duplicate aliquots of standard solution B. Average the response ratios of the standards immediately before and after the specimen solution. Use this average to calculate the purity of the two specimen solutions. NOTES: The flame may be extinguished by the passage of the solvent peak through the detector; it should be reignited within 30 seconds of injection to allow re-equilibration before the first peak of interest arrives at the detector. With most specimens, sufficient clarification of the solution is obtained by allowing the solution to stand about 15 minutes. Occasionally, specimens will require centrifuging. In either case, a layer of solids will be found floating on the solvent. If a slight positive pressure is applied (with a bulb) to the pipet while it is carefully inserted into the solution, no particles should be removed with the aliquot taken. The inclusion of fine particles in the solution used for injection can result in clogging of the syringe needle.

(i) Calculations. For each injection calculate the response ratio as follows:

$$\text{Response ratio} = \frac{\text{Area of malathion peak}}{\text{Area of internal standard peak}}$$

Calculate the percent by weight purity as follows:

$$\text{Percent purity} = \frac{ABC}{DE}$$

where: A = Average response ratio for specimen solution,
B = Weight of malathion standard taken in grams,
C = Percent purity of malathion standard,
D = Average response ratio for standard solution B, and
E = Weight of specimen taken in grams.

4.2.4.3 Emulsion stability.

(a) Stirrer. Use a T-shaped stirrer made of metal or glass consisting of a rod 10 millimeters (mm) in diameter and 50 mm long which is attached at right angles to the end of a 5-mm diameter shaft. When stirring, raise the stirrer off the bottom of the beaker just enough to permit free rotation.

(b) Hard water. Dissolve 0.3037 g of anhydrous calcium chloride and 0.1388 g of magnesium chloride hexahydrate in sufficient water to make 1 liter of solution. This water has a hardness of 342 ppm calculated as calcium carbonate.

(c) Soft water. Prepare soft water by diluting 1 part of the hard water prepared as specified in (b) with 5 parts of water. This water has a hardness of 57 ppm calculated as calcium carbonate.

(d) Procedure. Place 95 ml of hard water prepared as specified in (b) having a temperature of 26.7° ± 5°C into a 250-ml Griffin low-form beaker (approximately 85 mm high and 65 mm in diameter). Using a stirrer as specified in (a), stir at 1000 ± 50 revolutions per minute. Add 5.0 ml of the specimen from a pipet and continue stirring for 1 minute. Pour the emulsion formed into a 100-ml glass-stoppered graduated cylinder. Note the time and set aside for 30 minutes. Immediately after this time period, examine the emulsion carefully under strong transmitted light (100 watts) for signs of oil separation and top or bottom creaming. Record the percent separation, if any, by volume. Allow the emulsion to stand at a temperature of 26.7° ± 5°C for 24 hours. Reform the emulsion by inverting and righting the stoppered cylinder 30 times. Exactly 30 minutes after the emulsion has been reformed, re-examine the emulsion under strong light and record the results. Conduct a parallel test using soft water prepared as specified in (c) in place of the hard water in the procedure.

4.2.4.4 Color. Determine the color of the specimen in accordance with ASTM D 1500.

4.2.4.5 pH of aqueous emulsion. Determine the pH of a 5-percent aqueous emulsion of the specimen in accordance with ASTM E 70.

4.2.4.6 Water content. Determine the percent by weight water in the specimen in accordance with ASTM D 1533.

4.2.4.7 Iron content.

(a) Standard iron solution. Dissolve 0.100 g of pure iron wire in 10 ml of 10-percent sulfuric acid and 3 ml of nitric acid. Cool, transfer to a 1-liter volumetric flask, and dilute to volume with water. Transfer a 10-ml aliquot to a 100-ml volumetric flask and dilute to volume. One ml of this standard iron solution contains 0.01 mg of iron.

(b) Standard graph preparation. By means of a buret, measure 0.5, 1.0, 2.0, 7.0, 10.0, 15.0, and 20.0 ml portions, respectively, of the standard iron solution into seven 100-ml volumetric flasks. Add to each 10 ml of 1 molar hydroxylamine solution. Heat to just boiling, cool, add a small piece of congo red paper, and add sufficient ammonium hydroxide solution to change the color of the congo red paper to a bluish-red. Add 10 ml of 0.1-percent 1,10-phenanthroline solution. Allow the color to develop for 10 minutes, dilute to volume with water, and mix. Place a blank of the reagents in a suitable spectrophotometer having a 525-millimicron filter and a 2-centimeter cell path. Adjust the instrument to zero. Record the dial readings for each of the above standards and plot them against the concentration in milligrams per 100 ml. Use the resulting graph for all subsequent iron determinations.

(c) Procedure. Weigh 2.0 ± 0.01 g of the specimen into a 100-ml silica evaporating dish which has previously been washed with hydrochloric acid. Using a hood, gently ignite using a small flame and avoiding application of excessive heat to the bottom of the dish. When the specimen ceases burning, heat gently with a meeker burner until easily combustible matter is destroyed. Transfer to a muffle furnace at 800°C. When the fumes cease, close the furnace door and leave the dish in the furnace 10 to 15 minutes to destroy the remaining carbon. Remove the dish and cool in a desiccator. Add 3 ml of hydrochloric acid and 3 ml of water. Cover with a clean watch glass and heat 30 minutes on a steam bath. Cool and filter through double acid washed dense texture filter paper. (If the filtrate is not clear, refilter using double paper if necessary.) Rinse the filter several times with small portions of water. Add 10 ml of 1 molar hydroxylamine hydrochloride solution and proceed as in the preparation of the graph in (b). Zero the instrument with a reagent blank. Record the dial reading. From the graph prepared in (b), determine the milligrams of iron in 100 ml for the specimen.

$$\text{Iron, ppm} = \frac{1000\ A}{W}$$

where: A = Milligrams of iron and
W = Weight of specimen in grams.

4.2.4.8 Compatibility with diesel fuel oil. With all ingredients at 27°C (+3° or -0°C) add 5 ml of specimen to 5 ml of solvent conforming to 3.1.3. Mix thoroughly and then add to 90 ml of diesel fuel oil, conforming to grade DF-2 of VV-F-800 and having an aniline point no greater than 60°F, in a 100-ml glass-stoppered graduated cylinder. Stopper the cylinder and mix the contents thoroughly by inverting and righting the cylinder 30 times. Allow to stand for 10 minutes and then examine for phase separation and sedimentation. Store at 29°C (+3° or -0°C) for 24 hours and re-examine.

4.2.5 Container leakage test. Test the container for leakage in accordance with the static leak techniques of method 5009.1 of Fed. Test Method Std. No. 101.

5. PREPARATION FOR DELIVERY

5.1 Packaging. The emulsifiable concentrate shall be unit packaged level A, level B, or commercial as specified (see 6.2).

5.1.1 Levels A and B.

5.1.1.1 3.8-Liter quantity. A quantity of 3.80 (+0.04 or -0) liters of emulsifiable concentrate shall be packaged in a nominal 1-gallon (gal) capacity steel pail conforming to type I, class 4 of PPP-P-704. The pail shall be provided with an extensible, flexible spout closure having a pilfer-deterrent seal. The pail shall be completely lined with two coats of a high-baked-on resin which shall neither affect nor be affected by the emulsifiable

concentrate (see 6.3). Threaded closures shall be closed to a torque within a range as recommended by the container supplier. There shall be no evidence of leakage from the container when tested as specified in 4.2.5.

5.1.1.2 19-Liter quantity. A quantity of 19.0 (+0.2 or -0) liters of emulsifiable concentrate shall be packaged as specified in 5.1.1.1 except that the pail shall have a nominal capacity of 5 gal.

5.1.1.3 208-Liter quantity. A quantity of 208 (+2 or -0) liters of emulsifiable concentrate shall be packaged in a clean, dry, nominal 55-gal capacity steel drum conforming to type I, class A with cap seals of PPP-D-729. The drum shall be lined as specified for the pail in 5.1.1.1. Closures shall be gasketed with material which neither affects nor is affected by the emulsifiable concentrate. Closures shall be torqued closed to a torque within a range as specified by the drum manufacturer to prevent leakage.

5.1.2 Commercial (for civil agencies). The emulsifiable concentrate, in quantities as specified in the contract or order, shall be packaged in accordance with normal commercial practice. The complete package shall be designed to protect the emulsifiable concentrate against damage during shipment, handling, and storage.

5.1.3 Commercial (for military activities). A specified quantity (see 6.2) of emulsifiable concentrate shall be packaged commercially in accordance with MIL-STD-1188.

5.2 Packing. The emulsifiable concentrate shall be packed level A, level B, or commercial as specified (see 6.2).

5.2.1 Level A.

5.2.1.1 3.8-Liter quantity. Four 3.8-liter pails of emulsifiable concentrate packaged as specified in 5.1.1.1 shall be packed upright in a close-fitting box. The box shall conform to class 2, style 4, grade A of PPP-B-621 or to type overseas, style A, B, or I, grade A of PPP-B-601. Each box shall be for a type 2 load and shall be closed and reinforced as specified in the applicable box specification. Motion of contents shall be prevented by inserting fiberboard pads as needed. The fiberboard pads shall be formed from material conforming to minimum grade W6c of PPP-F-320.

5.2.1.2 19-Liter quantity. The 19-liter quantity packaged as specified in 5.1.1.2 shall require no further protection.

5.2.1.3 208-Liter quantity. The 208-liter quantity packaged as specified in 5.1.1.3 shall require no further protection.

5.2.2 Level B.

for weighing. The granules lying on the re[illegible] as specified in

5.2.2.1 3.8-Liter quantity. Four 3.8-liter pails of emulsifiable concentrate packaged as specified in 5.1.1.1 shall be packed as specified in 5.2.1.1 except that the box shall conform to grade V3c of PPP-B-636 and the closure, waterproof sealing and reinforcing of the boxes shall be in accordance with the appendix to PPP-B-636.

5.2.2.2 19-Liter quantity. The 19-liter quantity packaged as specified in 5.1.1.2 shall require no further protection.

5.2.2.3 208-Liter quantity. The 208-liter quantity packaged as specified in 5.1.1.3 shall require no further protection.

5.2.3 Commercial (for civil agencies). The emulsifiable concentrate shall be packed to insure delivery at destination, provide for redistribution by the initial receiving activity, and be acceptable by common carrier under the National Motor Freight Classification and Uniform Freight Classification, and all applicable DOT regulations. The shipping containers shall be capable of withstanding prolonged periods of storage at a minimum height of 4.6 meters.

5.2.4 Commercial (for military activities). The emulsifiable concentrate shall be packed in accordance with MIL-STD-1188.

5.3 Unitization. Level A and level B packs shall be palletized in accordance with the applicable regulations of MIL-STD-147. Commercial packs shall be palletized to meet carrier acceptance and to assure safe arrival at destination without damage.

5.4 Marking. Marking for civil agency shipments shall be in accordance with Fed. Std. No. 123. For military activity shipments, level A and level B packages, packs, and palletized loads shall be marked in accordance with MIL-STD-129; commercial packages and packs shall be marked in accordance with MIL-STD-1188; and commercial palletized loads shall be marked to assure identification of contents and to show the name and address of the contractor and destination. All packages and shipping containers shall be marked to show the date of manufacture of the emulsifiable concentrate. All packs shall be marked in accordance with DOT regulations.

5.4.1 Labeling. Labels shall be securely affixed in place on the container with water-resistant label adhesive conforming to MMM-A-178 and shall be waterproofed by coating the entire outer surface of the label with clear acrylic coating compound conforming to MIL-C-17504 or varnish conforming to TT-V-121. All containers shall be labeled in compliance with 40 CFR 162 and 49 CFR 171 to 179. Labels shall be approved and registered in accordance with 40 CFR 162. As a minimum, each container shall be labeled with the following information:

(a) The name and percent by weight of each active ingredient
(b) The name and percent by weight of each inactive ingredient
(c) National stock number, specification number, contract number, lot number, date of manufacture, and shelf life code.

foliage green on some oaks, maples

(d) Manufacturer's name and address
(e) EPA registration and establishment number
(f) Storage and disposal data
(g) Precautionary information indicating hazards to humans and domestic animals, environmental hazards, and physical or chemical hazards
(h) Directions for use against ants, aphids, bagworms, bedbugs, carpet beetles, tent caterpillars, clothes moths, cockroaches, crickets, earwigs, flies (adults and larva), Japanese beetles (adult), leafhoppers, mealybugs, biting midges, clover and spider mites, mosquitos (larva and adults), scale insects, thrips, and white flies.

6. NOTES

6.1 Intended use. The emulsifiable concentrate covered by this specification is intended for use as spray and bait applications in the control of the insects specified in 5.4.1(h). Class 1 emulsifiable concentrate is intended for indoor application where odor may be a cause of objection. Class 2 emulsifiable concentrate is intended for outdoor application where odor is not a cause for objection.

6.2 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) Class of emulsificable concentrate required (see 1.2).
(c) Unit quantity required (see 5.1.3).
(d) Level of packaging and packing required (see 5.1 and 5.2).

6.3 Container coatings. Two-coat lining systems that have been found satisfactory for use with the emulsificable concentrate are as follows:

(a) American Can Company, Metal and Thermit Division - B124-17.
(b) Bradley Vrooman Company - A21846.
(c) "Heresite" - P413D.
(d) Inland Steel Container Company - IC-26.
(e) Interchemical Company - 14-474.
(f) Rheem Container Company - #970.
(g) Varnish conforming to MIL-V-12276, type III, class optional, composition G or L as appropriate for manufacturing site.

6.4 Malathion content test materials and equipment. Malathion of known purity may be obtained from American Cyanamid Co., Agricultural Research Division, P.O. Box 400, Princeton, NJ 08540. The prepared column packing may be obtained from Supelco, Inc., Supelco Park, Bellefonte, PA 16823 (specify "Pesticide Grade"); Alltech Associates, 202 Campus Drive, Arlington Heights, IL 60004; or Applied Science Laboratories, P.O. Box 440, State College, PA 16801. "SP 2401" is available under catalog No. 02-1282 from Supelco, Inc. A "HI-EFF Fluidizer" is available from Applied Science Laboratories, Inc.

6.5 Significant places. For the purpose of determining conformance with this specification, an observed or 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 E29.

MILITARY INTERESTS:

Custodians:

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Navy - YD
Air Force - 68

Review activities:

Army - MD, GL
DLA - GS

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Preparing activity:

Army - EA

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Civil Agency Coordinating Activities:

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