

INCH-POUND

MIL-DTL-53030D
w/AMENDMENT 1
20 December 2017
SUPERSEDING
MIL-DTL-53030D
14 December 2011

DETAIL SPECIFICATION

PRIMER COATING, EPOXY, WATER BASED,
LEAD AND CHROMATE FREE

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 for a water based, air-drying, corrosion-inhibiting, epoxy type primer for pretreated ferrous and nonferrous metals. The primer is lead and chromate free and is compatible with chemical agent resistant aliphatic polyurethane topcoats. The primer contains no more than 2.8 pounds per gallon (lbs/gal) (340 grams per liter (g/l)) of volatile organic compounds (VOC) and is hazardous air pollutant-free (HAP-free), as applied.

1.2 Types. The coating will be furnished in the following types as specified (see 6.2).

- Type II - Enhanced corrosion performance, water dispersible technology. The enhanced corrosion performance includes 1,008 hours salt spray and 30 cycles on the cyclic corrosion test.
- Type III - Self contained portable kits. The kits contain the type II coating epoxy primer in a touch-up system.

Comments, suggestions, or questions on this document should be addressed to: Director, U.S. Army Research Laboratory, Weapons and Materials Research Directorate, Specifications and Standards Office, ATTN: RDRL-WMM-C, Aberdeen Proving Ground, MD 21005-5069 or emailed to richard.j.squillaciotti.civ@mail.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <https://assist.dla.mil/>.

AMSC N/A

FSC 8010

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1.2.1 Part or identifying number (PIN). Use the following example to create the PINs to be used for coatings acquired to this specification. When other container sizes are required, change the designator accordingly, such as 100ML for 100 milliliters.

| | | | | | | |
|-----------------------------|---|--|---|--|---|--|
| <u>M53030</u> | - | <u>X</u> | - | <u>XXXX</u> | - | <u>XXXXX</u> |
| Specification Identifier | | Coating type designator Type II = 2 Type III = 3 | | Container size designator 1 quart = 001Q 1 gallon = 001G | | Color designator SAE-AMS-STD 595 color chip number |

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 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 cited in the solicitation or contract.

FEDERAL SPECIFICATIONS

TT-C-490 - Chemical Conversion Coatings and Pretreatments For Metallic Substrates (Base for Organic Coatings).

FEDERAL STANDARDS

FED-STD-313 - Material Safety Data, Transportation Data, And Disposal Data For Hazardous Materials Furnished To Government Activities.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-DTL-5541 - Chemical Conversion Coatings on Aluminum and Aluminum Alloys.
MIL-DTL-12468 - Decontaminating Agent, STB.
MIL-PRF-23699 - Lubricating Oil, Aircraft Turbine Engine, Synthetic Base, NATO Code Number O-156.
MIL-DTL-53039 - Coating, Aliphatic Polyurethane, Single Component, Chemical Agent Resistant.
MIL-DTL-64159 - Camouflage Coating, Water Dispersible Aliphatic Polyurethane, Chemical Agent Resistant.

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- MIL-PRF-83282 - Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Metric, NATO Code Number H-537.
- MIL-PRF-87257 - Hydraulic Fluid, Fire Resistant; Low Temperature, Synthetic Hydrocarbon Base, Aircraft and Missile.

(Copies of these documents are available online at <https://assist.dla.mil/>).

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

ASTM INTERNATIONAL

- ASTM A109/A109M - Standard Specification for Steel, Strip, Carbon (0.25 Maximum Percent), Cold Rolled.
- ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High Strength Low Alloy, High Strength Low Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
- ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
- ASTM D522 - Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
- ASTM D523 - Standard Test Method for Specular Gloss.
- ASTM D610 - Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces.
- ASTM D714 - Standard Test Method for Evaluating Degree of Blistering of Paints.
- ASTM D870 - Standard Practice for Testing Water Resistance of Coatings Using Water Immersion.
- ASTM D1193 - Standard Specification for Reagent Water.
- ASTM D1210 - Standard Test Method for Fineness of Dispersion of Pigment Vehicle Systems by Hegman Type Gage.
- ASTM D1364 - Standard Test Method for Water in Volatile Solvents (Karl Fischer Reagent Titration Method).
- ASTM D1394 - Standard Test Methods for Chemical Analysis of White Titanium Pigments.
- ASTM D1475 - Standard Test Method for Density of Liquid Coatings, Inks, and Related Products.
- ASTM D1654 - Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
- ASTM D1849 - Standard Test Method for Package Stability of Paint.
- ASTM D2371 - Standard Test Method for Pigment Content of Solvent Reducible Paints.
- ASTM D3335 - Standard Test Method for Low Concentrations of Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy.

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- ASTM D3359 - Standard Test Methods for Measuring Adhesion by Tape Test.
- ASTM D3363 - Standard Test Method for Film Hardness by Pencil Test.
- ASTM D3924 - Standard Specification for Standard Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials.
- ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.
- ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
- ASTM D5895 - Standard Test Methods for Evaluating Drying or Curing During Film Formation of Organic Coatings Using Mechanical Recorders.
- ASTM D7232 - Standard Test Method for Rapid Determination of the Nonvolatile Content of Coatings by Loss in Weight.
- ASTM G90 - Standard Practice for Performing Accelerated Outdoor Weathering of Nonmetallic Materials Using Concentrated Natural Sunlight.

(Copies of these documents are available from www.astm.org).

GENERAL MOTORS CORPORATION

- GMW14872 - Cyclic Corrosion Laboratory Test

(Copies of this document are available from www.ihs.com).

SAE INTERNATIONAL STANDARDS / Aerospace Material Specifications

- SAE-AMS-STD 595 Colors Used in Government Procurement.
SAE-AMS-STD 595/27722, Gray, Semigloss
SAE-AMS-STD 595/34094, Green, Flat

(Copies of these documents are available from www.sae.org/servlets/index).

2.4 Order of precedence. Unless otherwise noted herein or in the contract, 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 Qualification. The primer furnished under this specification shall be a product which is qualified for listing on the applicable Qualified Products Database (QPD) before contract award (see 4.2 and 6.4). Any change in the formulation of a qualified product shall necessitate its requalification. The material supplied under contract shall be identical, within manufacturing tolerances, to the product receiving qualification.

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3.2 Color. The color of the primer shall be characteristic of titanium dioxide pigments or a light gray not darker than color chip number 27722 of SAE-AMS-STD 595.

3.3 Toxic ingredients. Other than parachlorobenzotrifluoride (PCBTF), the primer shall contain no benzene (benzol), chlorinated solvents, or ethylene based glycol ethers and their acetates (see 4.5.3).

3.4 Compositions. The primer shall consist of two components. Component A shall be an epoxy resin solution containing all of the corrosion inhibitors and pigments and shall be furnished in primary containers of 1 quart, 1 gallon, and 5 gallon capacities, as specified (see 6.2). Component B shall be a clear or milky resin solution and shall be furnished in primary containers of 1/2 pint, 1 quart or 1 gallon capacities, as specified (see 6.2). The primer shall be furnished as a kit and when the components are mixed, four parts by volume of component A to one part by volume of component B, and reduced as specified by the manufacturer, a product meeting the applicable requirements of this specification shall result. The primer kit sizes shall be as specified in 3.4.1.

3.4.1 Primer kit sizes. Kit sizes, as specified (see 6.2), shall be designated as 1.25 quart, 1.25 gallon and 5 gallon for type II. They shall be categorized to correspond with the rated capacity of the primary containers for component A. The primary container combinations for the kit sizes shall be as follows:

| | | |
|------------------------|---|--|
| 1.25 quart primer kit | = | one, 1 quart can for component A one, 1/2 pint can for component B |
| 1.25 gallon primer kit | = | one, 1 gallon can for component A one, 1 quart can for component B |
| 5 gallon primer kit | = | one, 5 gallon can for component A one, 1 gallon can for component B |

3.4.2 Primer kit contents. Each type II primer kit shall consist of prescribed amounts of both components, each in a separate primary container. The primary containers for the components shall be filled to such a level that when the components are mixed together, the total volume of the mixture equals the specified kit size. The filling levels for volumetric proportions of 4:1, expressed as a percent of each primary container's rated capacity, are as follows:

TABLE I. Container size and fill level.

| Kit size | Primary container size | Component | Type II Container Fill Level |
|----------|------------------------|-----------|------------------------------|
| Quart | 1 quart | A | 100% |
| | 1/2 pint | B | 100% |
| Gallon | 1 gallon | A | 100% |
| | 1 quart | B | 100% |
| 5-Gallon | 5 gallon | A | 80% |
| | 1 gallon | B | 100% |

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3.4.3 Pigment. The pigment portion of the primer shall conform to the percent by weight requirements of table II when tested as specified in 4.5.4.2. Hexavalent chromium shall not be present. Mixed metal oxides shall be HAP-free. Compounds of antimony, arsenic, beryllium, cadmium, cobalt, chromium, cyanide, lead, manganese, mercury, nickel and selenium shall be absent. Small amounts of tinting pigments are permissible to achieve the color as specified in 3.2.

TABLE II. Quantitative requirements, percent by weight of pigment.

| Characteristics | Type II | |
|--|---------|------|
| | Min | Max |
| Titanium dioxide | 17.0 | - |
| Zinc phosphate <u>1/</u> | 10.0 | - |
| Corrosion inhibiting pigment <u>2/</u> | 1.0 | - |
| Siliceous extenders | - | 45.0 |

1/ Zinc phosphate or metal phosphate complex.

2/ Heucorin RZ, Heubach GmbH Company or equivalent.

3.5 Quantitative requirements. The primer shall conform to the quantitative requirements of table III, IV and V when tested as specified in 4.5.

3.5.1 Component A (epoxy resin component). Component A shall conform to the quantitative requirements of table III when tested as in section 4.

TABLE III. Component A requirements.

| Characteristics | Type II | |
|--|---------|------|
| | Min | Max |
| Total solids, percent by weight of component A | 55 | - |
| Pigment, percent by weight of component A | 32 | - |
| Vehicle solids, percent by weight of component A | 18 | - |
| Epoxy resin, percent by weight of vehicle solids | 88 | - |
| Density, weight/gallon, pounds | 11.5 | 12.5 |
| Fineness of grind | 5.0 | - |

3.5.2 Component B (catalyst component). Component B shall conform to the quantitative requirements of table IV when tested as in section 4.

TABLE IV. Component B requirements.

| Characteristics | Type II | |
|--|---------|------|
| | Min | Max |
| Vehicle solids, percent by weight of component B | 25 | - |
| Volatile content, percent by weight of component B | - | 75 |
| Weight/gallon, pounds | 7.00 | 9.25 |

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3.5.3 Mixed primer. The mixed primer shall conform to the quantitative requirements of table V when tested as in section 4 and shall contain no more than 2.8 lbs/gal (340 g/l) VOC content and is HAP-free.

3.6 Qualitative requirements - liquid.

3.6.1 Condition in container.

3.6.1.1 Component A. When tested as specified in 4.5.7.1, component A shall be free from grit, seeds, skins, abnormal thickening or livering in a freshly opened container and shall show no more pigment settling or caking than can be easily and completely reincorporated to a smooth homogeneous state.

3.6.1.2 Component B. When tested as specified in 4.5.7.2, component B shall be free from sediment and suspended matter when examined by transmitted light. It shall show no livering, curdling, gelling or skinning in a freshly opened full container.

3.6.2 Storage stability. After being tested as specified in 4.5.8, the primer shall meet all of the requirements of this specification.

TABLE V. Mixed primer requirements.

| Characteristics | Type II | |
|---|---------|------|
| | Min | Max |
| Specular gloss, 60 degree | - | 35 |
| Drying time: | | |
| Set to touch, minutes | - | 45 |
| Dry hard, hours | - | 2.0 |
| Dry through, hours | - | 24 |
| Full cure, days | - | 7 |
| Pot life, hours | 4.0 | - |
| Lead metal, percent by weight of total solids | - | 0.06 |

3.6.2.1 Component A. A full container of component A shall show no skinning, livering, curdling, hard dry caking nor tough gummy sediment when tested as specified in 4.5.8.1. The material shall mix readily to a smooth homogeneous state and meet all other requirements of this specification.

3.6.2.2 Component B. A full container of component B shall be free from sediment and suspended matter when examined by transmitted light as specified in 4.5.8.2. The material shall be identical in appearance to the original sample. It shall show no livering, curdling, gelling or skinning and shall meet all other requirements of this specification.

3.6.3 Accelerated storage stability. After being tested as specified in 4.5.9, the primer shall meet all of the requirements of this specification. Each component shall be free of the defects listed in

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3.6.2.1 and 3.6.2.2, and when prepared as specified in 4.5.11.1, the admixed primer shall be a smooth homogeneous mixture free from grit, seeds, lumps, and skins.

3.6.4 Freeze-thaw stability. After being tested as specified in 4.5.10, the primer shall meet all of the requirements of this specification. Each component shall be free of the defects listed in 3.6.2.1 and 3.6.2.2, and when prepared as specified in 4.5.11.1 the admixed primer shall be a smooth homogeneous mixture free from grit, seeds, lumps, and skins.

3.6.5 Mixing properties.

3.6.5.1 Mixing. When tested as specified in 4.5.11.1, a smooth homogeneous mixture shall result.

3.6.5.2 Dilution. When the admixed primer is reduced with water as specified in 4.5.11.2, there shall be no evidence of incompatibility other than that of a transient nature during the first half of water addition. The primer shall be free from grit, seeds, skins or lumps.

3.6.6 Spraying properties. When tested as specified in 4.5.12, the primer shall spray satisfactorily in all respects and shall show no running, sagging, or streaking. The dried film shall show no dusting, mottling, or color separation and shall present a smooth finish free from seeds.

3.7 Qualitative requirements - dried film.

3.7.1 Flexibility. A film of primer tested as specified in 4.5.13 shall withstand bending without cracking or flaking.

3.7.2 Adhesion. The assessment of the adhesion of the coating film shall be determined by its ability to not peel from the substrate when tested in accordance with ASTM D3359, as specified in 4.5.14. The resultant test rating shall be classified as scale 4B or better.

3.7.3 Water resistance. A film of primer, tested as specified in 4.5.15, shall show no wrinkling or blistering immediately after removal of the panel from the water. The primer shall be no more than slightly softened when examined 2 hours after removal. After 24 hours air drying, the portion of the panel which was immersed shall be the same with regard to hardness, adhesion, color and gloss as compared to the portion which was not immersed. Film softening shall not exceed a 2 pencil hardness units difference (see ASTM D3363) from an unexposed film with identical cure history prior to water exposure.

3.7.4 Hydrocarbon fluid resistance. A film of primer, tested as specified in 4.5.16, shall show no blistering or wrinkling and no more than a slight yellowing or softening upon removal from the fluid. After 2 hours air drying, the portion of the panel that was immersed shall be the same with regard to hardness, adhesion, color and gloss from a panel prepared at the same time but not immersed. Film softening shall not exceed a 2 pencil hardness units difference (see ASTM D3363) from an unexposed film with identical cure history prior to hydrocarbon fluid exposure.

3.7.5 Corrosion resistance.

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3.7.5.1 Salt spray resistance. A film of primer tested as specified in 4.5.17.1 and examined immediately after removal from the salt spray test shall show no more than a trace of rusting (ASTM D610, table I, rust grade 9) or corrosion, no more than five (5) scattered blisters that are few in frequency of occurrence with a blister size number 8, and none larger than one (1) mm in diameter for unscribed regions (see ASTM D714). Scribed areas shall have ratings as specified in ASTM D1654 procedure A of not less than six (6) for steel or eight (8) for aluminum panels. Upon removal of the primer, there shall be no more than a trace of rusting, pitting, or corrosion on the panels (ASTM D610, table I, rust grade 9).

3.7.5.2 Cyclic corrosion resistance. A film of primer tested as specified in 4.5.17.2 and evaluated using ASTM D1654 procedure A shall have a rating of not less than seven (7). There shall be no more than five (5) scattered blisters in the unscribed areas.

3.7.6 Fluid resistance. A film of primer tested as specified in 4.5.18 shall show no blistering, wrinkling or loss of adhesion immediately after removal. Slight initial softening is acceptable. After a four (4) hour recovery period, the hardness of the primer shall be fully recovered. Discoloration of the primer is acceptable and shall not be cause for rejection.

3.7.7 Recoating. A film of primer, tested as specified in 4.5.19, shall show no blistering, wrinkling or other evidence of lifting. The film shall receive a rating of 4B or better, according to ASTM D3359, method B.

3.7.8 Weather resistance. Films of the primer prepared and exposed as specified in 4.5.20 shall show no rusting, cracking, checking, flaking, or loss of adhesion. Primer that has a topcoat coating with Green 383, 34094 as specified in MIL-DTL-64159 type II shall show no more than light chalking (see ASTM D4214). Upon removal of the coating system, the surface of the metal shall show no more than a trace of rusting, pitting, or corrosion (ASTM D610, table I, rust grade 9).

3.7.9 Super tropical bleach (STB) resistance. When tested as specified in 4.5.21, a film of the coating shall show no blistering, wrinkling, or film softening when examined immediately after washing with water. Film softening shall not exceed a 2 pencil hardness units difference (see ASTM D3363) from an unexposed film with identical cure history prior to STB exposure. After drying, there shall be a maximum Delta (Δ) E color change of 2.5 $L^*a^*b^*$ units when comparing a portion of the untested panel to that of the tested area. The STB composition shall be in accordance with MIL-DTL-12468.

3.8 User instruction marking and precaution sheet. All primary containers shall be legibly labeled "Component A (Pigmented Base Component)" or "Component B (Curing Component)" as applicable, with the manufacturer's mixing and thinning instructions, the VOC content (in pounds per gallon or grams per liter) and the following:

CAUTION: The Surgeon General requires airline respirators to be used unless air sampling shows exposure to be below standards. Then, either chemical cartridge respirators or airline respirators are required. Avoid contact with skin and eyes. Use with adequate ventilation. For other safety recommendations, refer to the Safety Data Sheet (SDS). Keep containers closed.

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INSTRUCTIONS FOR USE:

- a. The surface to be primed shall be clean and free of oil and dust.
- b. Apply over pretreated metal.
- c. Component B shall always be added to component A under vigorous agitation following the manufacturer's recommendations. Deionized water shall also be added under vigorous agitation following the manufacturer's recommendations to achieve the correct viscosity for application. A squirrel cage mixer shall be used to mix the components together and while adding the water.
- d. Allow for a 20-30 minute induction time before use.
- e. Equipment shall be adequately grounded. Clean spray equipment immediately after use.
- f. The primer from one vendor, or component thereof, shall never be mixed with that of another vendor.

MIX ONLY THAT AMOUNT TO BE USED WITHIN 4-6 HOURS.

3.9 Toxicity clearance. All new chemicals and materials being added to the Army supply system shall have a toxicity clearance. A toxicity clearance involves a toxicological evaluation of materials prior to introduction into the Army supply system. The Army program manager shall be responsible for identifying technically feasible materials and requesting a toxicity clearance for use of that material within their program (see 6.5).

3.10 Safety Data Sheet. A SDS shall be prepared for the primer in accordance with FED-STD-313 and forwarded to the qualifying activity (see 6.4.2). The SDS shall be included with each shipment of the material covered by this specification and submitted to pertinent Government agencies as stated in FED-STD-313.

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Qualification inspection (see 4.2).
- b. Conformance inspection (see 4.3)

4.2 Qualification inspection. Qualification shall be conducted by the qualifying activity (see 6.4). The qualification test sample shall consist of five (5) quarts for type II. The samples shall be legibly identified (see 6.4.3). Qualification inspection shall consist of tests for all requirements specified in section 3 in accordance with table V, and examination for user instruction marking (see 3.8). The results of each test shall be compared with the applicable requirement in section 3. Failure to conform to any requirement shall be counted as a defect, and paint represented by the sample test shall not be approved for inclusion in the QPD under this specification. Conditional approval shall be given until completion of the weathering test. Upon completion of this test, then final approval shall be given.

4.3 Conformance inspection. The manufacturer shall forward from each production lot (see 4.3.1) a batch validation letter detailing the batch number, manufacturer's code, specification

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and type number, QPL number and batch volume to U.S. Army Research Laboratory (ARL), Weapons and Materials Research Directorate (WMRD), ATTN: RDRL-WMM-C, Camouflage, Coatings and Corrosion Team, Building 4600, Deer Creek Loop, Aberdeen Proving Ground (APG), MD 21005-5066. The manufacturer shall perform conformance inspection testing on each production lot and have these test results on file when requested by the contracting officer. Conformance inspection for individual lots shall test for VOC, condition in container, total solids, fineness of grind, mixing properties, spraying properties, drying time, and 60 degree specular gloss. There shall be no failures (see 6.6).

4.3.1 Lot and batch formation. Unless otherwise specified in the contract or purchase description (see 6.2), a lot shall consist of all coatings of the same type, composition and color, from a single uniform batch, produced and offered for delivery at one time (see 6.4.4). Unless otherwise specified in the contract or purchase description (see 6.2), a batch shall consist of all coating material (in U.S. gallons) manufactured during one continuous operation and forming part of one contract or order for delivery (see 6.4.4). The addition of any substance to a batch shall constitute a new lot.

4.4 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with ASTM D3924. Also, unless otherwise stated in the test method or paragraph, room temperature shall be 73 ± 4 degrees Fahrenheit ($^{\circ}\text{F}$) (23 ± 2 degrees Celsius ($^{\circ}\text{C}$)) and a 40 - 70 percent range relative humidity.

4.4.1 Safety Data Sheet. The SDS shall address all components of the primer and be in compliance with the requirements of FED-STD-313. Nonconformance to 3.10 shall constitute failure of this requirement.

4.5 Test methods.

4.5.1 Test conditions. Except as otherwise specified herein, the routine testing and referee testing shall be conducted in accordance with ASTM D3924. A dry film thickness of 1.5 ± 0.2 mils (37.5 ± 5.0 microns) shall be used whenever film thickness is requested in any test, unless otherwise required by the test. Failure of any test result to fall within the specified ranges in section 3 shall constitute failure of the applicable test. For all tests requiring the use of the mixed primer, components A and B shall be mixed in proportions specified in paragraph 4.5.11.

4.5.2 Test panels. Steel test panels shall be cold rolled SAE 1010 steel conforming to ASTM A109/A109M or ASTM A1008/A1008M, treated with a zinc phosphate coating in accordance with TT-C-490, type I. The panels shall have a Rockwell B hardness of 55 to 75 and a surface roughness of 30 to 45 micro inches (arithmetic average) as rolled. Aluminum test panels shall be aluminum alloy 2024-T3 treated with MIL-DTL-5541, type II.

4.5.2.1 Primer preparation and application. For all tests requiring the use of admixed primer, component A shall be thoroughly mixed and combined with component B as specified in 4.5.11.1, and thinned with water according to the manufacturer's instructions to the desired spraying viscosity also recommended by the manufacturer. The primer shall be sprayed to a dry film thickness of 1.5 ± 0.2 mils (37.5 ± 5.0 microns).

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4.5.2.2 Test procedures. Tests (see table VI), shall be in accordance with ASTM, GM, or as specified herein. The right is reserved to make any additional tests deemed necessary to determine that the primer meets the requirements of this specification.

TABLE VI. Tests.

| Item | ASTM Method | Test Paragraph | Requirement Paragraph or Table |
|---------------------------------------|----------------|----------------|--------------------------------|
| Toxic ingredients | - | 4.5.3 | 3.3 |
| Nonvolatile component A | D7232 | 4.5.4.1 | Table II |
| Pigment analysis | - | 4.5.4.2 | 3.4.3 |
| Extraction of pigment | D2371 | 4.5.4.2 | Table I |
| Titanium dioxide | D1394 | 4.5.4.2.1 | Table I |
| Zinc phosphate/metal phosphate | - | 4.5.4.2.2 | Table I |
| Acid insoluble | - | 4.5.4.2.3 | Table I |
| Hexavalent chromium | - | 4.5.4.2.4 | 3.4.3 |
| Fineness of grind | D1210 | - | Table II |
| Lead metal | D3335 | 4.5.4.3 | Table IV |
| Nonvolatile component B | D7232 | 4.5.5.1 | Table III |
| Drying time | D5895 | 4.5.6.1 | Table IV |
| 60° specular gloss | D523 | 4.5.6.2 | Table IV |
| VOC | D3960 | 4.5.6.3 | 3.5.3 |
| Condition in container | - | 4.5.7 | 3.6.1 |
| component A | - | 4.5.7.1 | 3.6.1.1 |
| component B | - | 4.5.7.2 | 3.6.1.2 |
| Storage stability | - | 4.5.8 | 3.6.2 |
| component A | D1849 | 4.5.8.1 | 3.6.2.1 |
| component B | - | 4.5.8.2 | 3.6.2.2 |
| Accelerated storage stability | - | 4.5.9 | 3.6.3 |
| Freeze-thaw stability | - | 4.5.10 | 3.6.4 |
| Mixing properties | - | 4.5.11 | 3.6.5 |
| Spraying properties | - | 4.5.12 | 3.6.6 |
| Flexibility | D522 method B | 4.5.13 | 3.7.1 |
| Adhesion | D3359 method B | 4.5.14 | 3.7.2 |
| Water resistance | D870 | 4.5.15 | 3.7.3 |
| Hydrocarbon fluid resistance | - | 4.5.16 | 3.7.4 |
| Salt spray resistance | B117 | 4.5.17.1 | 3.7.5.1 |
| Cyclic corrosion resistance <u>1/</u> | - | 4.5.17.2 | 3.7.5.2 |
| Fluid resistance | - | 4.5.18 | 3.7.6 |
| Recoating | - | 4.5.19 | 3.7.7 |
| Weather resistance | G90 | 4.5.20 | 3.7.8 |
| STB resistance | - | 4.5.21 | 3.7.9 |

1/ General Motors Standard: GMW 14872.

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4.5.3 Toxic ingredients. Other than PCBTF, the manufacturer shall certify that the primer contains no benzene (benzol), chlorinated solvents, or ethylene based glycol ethers and their acetates. Nonconformance to 3.3 constitutes failure of this requirement.

4.5.4 Analysis of component A.

4.5.4.1 Nonvolatile (total solids) content. Determine the total solids (nonvolatile content) of component A in accordance with ASTM D7232. Check for compliance with table II.

4.5.4.2 Pigment analysis. Extract the pigment as in ASTM D2371, except use ethanol for extraction. Make appropriate qualitative and quantitative tests on the extracted pigment to determine if only permissible pigments were used. Nonconformance to table II shall constitute failure of this test.

4.5.4.2.1 Quantitative titanium dioxide. Determine titanium dioxide content by ASTM D1394. Nonconformance to the requirements in table I shall constitute failure of this test.

4.5.4.2.2 Zinc phosphate content. Determine the zinc phosphate content in accordance with 4.5.4.2.2.1 and 4.5.4.2.2.2.

4.5.4.2.2.1 Determination of zinc.

4.5.4.2.2.1.1 Reagents.

- a. Buffer solution (pH 10): 350 milliliters (ml) concentrated NH_4OH + 54 grams (g) NH_4Cl + H_2O to give 1000 ml.
- b. Eriochrome black T (0.5%): 0.25g Eriochrome black T + 2.2g hydroxylamine hydrochloride/50 ml methanol solution.
- c. Primary standard zinc oxide (0.200 (N) Normal concentration solution): Accurately weigh 4.069 g of oven-dried ZnO .
Dissolve it in 250 ml of the buffer solution and dilute to 500.0 ml.
- d. 0.5N Disodium ethylenediaminetetra-acetate dihydrate (EDTA): 37.2g EDTA/liter aqueous solution.

4.5.4.2.2.1.2 Procedure.

- a. Accurately weigh 1.0 gram of pigment into a 250 ml glass-stoppered Erlenmeyer flask.
- b. Add 25 ml of buffer, stopper, and shake vigorously every few minutes over a period of 30 minutes.
- c. Filter through fine paper into a 400 ml beaker, washing well with water until 200 ml of filtrate are collected.
- d. Add 20.0 ml of the EDTA (an excess) to the filtrate.
- e. Add 10 drops of Eriochrome black T.
- f. Titrate with standard ZnO to a wine-red end point (V_s).
- g. Run a blank by titrating 20.0 ml of the EDTA in 200 ml of an aqueous solution containing 25 ml of the buffer (V_b).

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4.5.4.2.2.1.3 Calculations.

Percent Zn = $((V_b - V_s) \times 0.2 \times 3.269) / (\text{Sample weight})$

Percent zinc phosphate = $((V_b - V_s) \times 0.2 \times 7.035) / (\text{Sample weight})$

Where: V_b = Milliliters of ZnO for blank and

V_s = Milliliters of ZnO for sample.

4.5.4.2.2.2 Determination of phosphate.

4.5.4.2.2.2.1 Reagents.

- a. Concentrated NH_4OH
- b. Concentrated HNO_3
- c. NH_4NO_3
- d. Ammonium molybdate - Johnson's formula: Mix 55 grams of $(\text{NH}_4)_6\text{MO}_7\text{O}_{24} \cdot 4\text{H}_2\text{O}$ and 50 g of NH_4NO_3 with 18 milliliters (ml) of concentrated NH_4OH and 20 ml H_2O . Stir. Dilute to about 700 ml with H_2O . Heat with occasional stirring until all salts have dissolved. Dilute to 1000 ml. Let stand overnight. Filter through fine paper but do not wash the residue.

4.5.4.2.2.2.2 Procedure.

- a. Accurately weigh 2.0 grams (g) of pigment into a 250 ml glass stoppered Erlenmeyer flask.
- b. Add 25 ml concentrated NH_4OH , stopper and shake vigorously every few minutes over a period of 60 minutes.
- c. Add 25 ml H_2O and filter through fine paper into a 400 ml beaker, washing well with water.
- d. Neutralize the filtrate with 7.5N HNO_3 (requires about 35 ml).
- e. Add 15 ml concentrated HNO_3 and 6 g of NH_4NO_3 . Stir.
- f. Heat the clear solution to 176 °F (80 °C) maximum and add 75 ml of ammonium molybdate with constant stirring.
- g. Stir for several minutes and let the precipitate settle for 2 hours.
- h. Filter through a tared crucible (Gooch or medium glass), transfer the precipitate, and wash with 1 percent HNO_3 (5 ml concentrated HNO_3 /500 ml solution). The washing shall be thorough.
- i. Give the collection precipitate a final wash with a small amount of water.
- j. Dry the crucible for 2 hours in a 221 °F (105 °C) oven.
- k. Cool crucible in a desiccator and determine the weight of the precipitate to the nearest one-tenth mg (it shall not exceed 3 g; if it does, repeat the determination with a smaller sample).

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4.5.4.2.2.2.3 Calculations.

$$\begin{aligned} \text{Percent phosphate [PO}_4\text{]} &= (\text{weight of precipitate} \times 5.029) / (\text{Sample weight}) \\ \text{Percent zinc phosphate} &= (\text{weight of precipitate} \times 11.18) / (\text{Sample weight}) \\ &[\text{Zn}_3(\text{PO}_4)_2 \cdot 2\text{H}_2\text{O}] \end{aligned}$$

4.5.4.2.2.2.4 Failure criteria. Nonconformance to table I shall constitute failure of this test.

4.5.4.2.3 Acid insoluble. Determine matter insoluble in acid in the extracted pigment in accordance with the appropriate test method. Nonconformance to the extender requirement of table I shall constitute failure of this test.

4.5.4.2.4 Hexavalent chromium. Determine the presence or absence of hexavalent chromium by either of the following chemical reagent screening techniques.

(a) Weigh approximately 250 milligrams (mg) of pigment into a small glass test tube. Add 5 ml of 25 percent aqueous KOH and shake vigorously for 1 - 2 minutes. Decant a one ml aliquot into a plastic micro-centrifuge tube and centrifuge for five (5) minutes at 17,000 rotations per minute, balancing the centrifuge with a tube containing one ml of the KOH solution. The resulting supernatant liquid shall be nearly colorless. Use the tube containing the KOH solution as a reference. A distinct yellow color indicates the presence of hexavalent chromium and therefore shall constitute failure of the test requirement.

(b) Weigh approximately 50 mg of pigment into a small glass test tube. Add 5 ml of 10 percent aqueous H₂SO₄ and shake vigorously for 1 - 2 minutes. Decant a one ml aliquot into a plastic micro-centrifuge tube and centrifuge for five (5) minutes at 17,000 rotations per minute, balancing the centrifuge with a second tube containing one ml of the H₂SO₄ solution. The solution in the second tube shall act as the test "blank". Immerse a chromate ion (CrO₄²⁻) test strip into the supernatant from each tube. Shake off the excess liquid and after approximately one minute compare the color change in the reaction zone of the strips to the color scale (concentration levels) provided by the manufacturer. The appearance of a purple/violet color from the "sample" strip is indicative of hexavalent chrome and therefore shall constitute failure of the test requirement. If a color change is apparent from the "blank" strip rerun the test using fresh, chromium-free reagents. The appearance of a pronounced color change is indicative of hexavalent chrome and therefore shall constitute failure of the test requirement.

4.5.4.3 Lead content. Determine the presence or absence of lead by weighing 50 mg of pigment into a small glass test tube. Add 5 ml of dilute HNO₃ and shake vigorously for 1 - 2 minutes. Decant a one ml aliquot into a plastic micro-centrifuge tube and centrifuge for five (5) minutes at 17,000 rpm, balancing the centrifuge with a tube containing one ml of the dilute HNO₃ solution. This tube shall also act as the test "blank". Immerse a lead test strip into the supernatant from each tube. Shake off the excess liquid and after approximately one minute compare the color change in the reaction zone of the strips to the color scale (concentration levels) provided by the manufacturer. If any color change is apparent from the "blank" strip rerun the test using fresh, lead-free reagents. For the "Sample" strip, the appearance of a bright red color is indicative of lead at a concentration level above the specification limit, while no color change or a faint pink color change is indicative of lead concentrations below the specification limit. Confirmation of

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the exact lead concentration in the coating's solids shall be determined using any authoritative quantitative method, such as ASTM D3335.

4.5.5 Analysis of component B.

4.5.5.1 Nonvolatile (total solids) content. Determine the percent nonvolatile (total solids) of component B as specified in 4.5.4.1, except that toluene shall be used to disperse the material. Nonconformance to table III shall constitute failure of this test.

4.5.6 Analysis of admixed primer.

4.5.6.1 Drying time. Spray the mixed coating on a test panel (see 4.5.2 and 4.5.2.1) to a dry film thickness of 1.5 ± 0.2 mils (37.5 ± 5.0 microns) and determine the drying under ambient conditions in accordance with ASTM D5895. Check for compliance with table IV.

4.5.6.2 Specular gloss (60 degrees). Prepare a film of the primer on steel as specified in 4.5.2.1 and allow to dry 48 hours. Determine the 60 degree specular gloss in accordance with ASTM D523. Nonconformance to table IV shall constitute failure of this test.

4.5.6.3 VOC. Separately mix components A and B, and then combine them as specified in 4.5.11.1, but do not thin the mixture. Keep the container tightly covered.

4.5.6.3.1 Nonvolatile (total solids) content. Determine the weight percent total solids, X_m , of the admixed primer in accordance with the procedure specified in 4.5.4.1.

4.5.6.3.2 Density. Determine the density, D_m , of the admixed primer in g/l in accordance with ASTM D1475.

4.5.6.3.3 Water content. Determine the weight percent water, X_w , of the admixed primer in accordance with ASTM D1364.

4.5.6.3.4 Calculation.

$$\text{VOC (g/l)} = (D_m(100 - X_m - X_w)) / (100 - X_w \times D_m/997).$$

4.5.6.3.5 Failure criterion. Nonconformance to the VOC requirement in 3.5.3 shall constitute failure of this test.

4.5.7 Condition in container.

4.5.7.1 Component A. Upon opening a full previously unopened container, the condition of the contents shall be examined for compliance with 3.6.1.1. Reseal, then agitate the container for 3 minutes on a paint shaker and examine for compliance with 3.6.1.1. On reexamination of the contents, the disclosure of any gel bodies or undispersed pigment indicates unsatisfactory settling properties.

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4.5.7.2 Component B. Upon opening a full previously unopened container the condition of the contents shall be examined for compliance with 3.6.1.2.

4.5.8 Storage stability.

4.5.8.1 Component A. Allow a full quart can of component A to stand undisturbed for 1 year in accordance with ASTM D1849 and then examine the contents. Evaluate the pigment settling as specified in 4.5.7.1 except agitate the can for 5 minutes on a paint shaker prior to reexamination. Perform applicable tests for compliance with 3.6.2.1.

4.5.8.2 Component B. Allow a full 8 ounce can of component B to stand for one year under standard laboratory conditions. At the end of this period, examine the contents for compliance to 3.6.2.2.

4.5.9 Accelerated storage stability. Allow tightly sealed glass jars filled with each component to stand undisturbed for 7 days at 140 degrees Fahrenheit (60 degrees Celsius). Allow to cool to room temperature and examine the contents. Mix the components as specified in 4.5.11.1. Nonconformance to 3.6.3 shall constitute failure of this test.

4.5.10 Freeze-thaw stability. Subject tightly sealed containers of each component to a 4 day cycle of 16 hours at 10 °F (-12 °C) and 8 hours at room temperature. After completion, examine the contents separately, and then mix as specified in 4.5.11.1. Nonconformance to 3.6.4 shall constitute failure of this test.

4.5.11 Mixing properties.

4.5.11.1 Mixing. Thoroughly stir component A by hand until uniform. If necessary, use a paint shaker to disperse any settled pigment in component A. Unless otherwise specified, mix one volume of component B with four volumes of component A. It is recommended that the two components be mixed together with a mechanical mixer. Nonconformance to 3.6.5.1 shall constitute failure of this test.

4.5.11.2 Dilution. Reduce the admixed primer with water meeting the type IV requirements of ASTM D1193 to a spraying viscosity as recommended by the manufacturer. The water shall be added slowly under constant agitation to prevent foaming. It is also recommended that a mechanical mixer be used while water is being added. Allow to stand undisturbed and covered for at least four (4) hours to check the pot life requirement. Nonconformance to 3.6.5.2 shall constitute failure of this test.

4.5.12 Spraying properties. Reduce the admixed coating in accordance with 4.5.11.2. Material shall be sprayed on a solvent cleaned test panel (see 4.5.2) to a dry film thickness of 1.5 ± 0.2 mils (37.5 ± 5 microns). The coating properties of the dry sprayed surface shall be observed for compliance with 3.6.6.

4.5.13 Flexibility. Determine flexibility in accordance with ASTM D522, method B. Spray the coating on a steel panel, tinplated 0.010 inches (0.254 mm) thick to a dry film thickness of $1.5 \pm$

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0.2 mils (37.5 ± 5 microns). Air dry for 168 hours. Bend the coated panels over a $\frac{1}{4}$ inch mandrel. Examine the coating for cracks over the area of the bend for compliance with 3.7.1.

4.5.14 Adhesion. Spray the primer as in 4.5.12 on a steel and aluminum panel pretreated as in 4.5.2. Air dry the specimens for seven (7) days. Perform adhesion testing as specified in ASTM D3359, method B and examine for compliance with 3.7.2.

4.5.15 Water resistance. Prepare two panels as specified in 4.5.12. Allow the panels to air dry for 168 hours. Coat all exposed, uncoated metal surfaces with wax or other suitable coating. Immerse the panels in distilled water at room temperature for 168 hours in accordance with ASTM D870. Nonconformance to 3.7.3 shall constitute failure of this test.

4.5.16 Hydrocarbon fluid resistance. Prepare films of primer as specified in 4.5.12. Allow the panels to air dry for 168 hours. Do not wax or coat the exposed metal surfaces. Immerse the panels for 168 hours in a hydrocarbon fluid conforming to JP8 at 70 ± 5 °F (21 ± 3 °C). Panels shall be immersed at a minimum depth of 50 %. At the end of the test period, remove and examine for compliance with 3.7.4. Nonconformance to 3.7.4 shall constitute failure of this test.

4.5.17 Corrosion resistance. Prepare ten (10) pretreated steel and five (5) aluminum 3 x 6 inch panels as specified in 4.5.2.1. Allow the panels to air dry for 168 hours. Coat the edges and uncoated metal surfaces of the witness panels with a suitable CARC coating prior to testing. Tape, wax, and chromated coatings are unacceptable for edge and back coatings.

4.5.17.1 Salt spray resistance. Take five (5) of the steel panels and all five (5) aluminum panels from 4.5.17 and make an "X" scribe through the primer. Expose the panels to 5 percent salt spray for 1,008 hours as specified in ASTM B117. Remove the panels and rinse gently in running water no warmer than 100 °F (38 °C) until free from any visible salt deposits. Examine immediately for compliance with 3.7.5.1. Strip the primer from the panels with a HAP-free paint remover. Inspect the panels for rust, pitting or corrosion. Nonconformance to 3.7.5.1 shall constitute failure of this test.

4.5.17.2 Cyclic corrosion resistance. Take the remaining five (5) steel panels from 4.5.17 and make an "X" scribe through the primer. Expose the panels to accelerated cyclic corrosion for 30 cycles as specified in GMW 14872. Upon removal, rinse panels until visible salt deposits are removed. Examine immediately for compliance with 3.7.5.2. Strip primer with HAP-free paint remover and inspect for rust, pitting or corrosion not evident with paint present. Nonconformance to 3.7.5.2 shall constitute failure of this test.

4.5.18 Fluid resistance. Prepare two (2) panels as specified in 4.5.12. Allow panels to dry for 168 hours. Do not wax or coat the exposed metal surfaces. Immerse in lubricating oil conforming to MIL-PRF-23699 at 250 ± 5 °F (121 ± 2.8 °C) for 24 hours. Also test sets of panels using hydraulic fluids conforming to MIL-PRF-87257 and MIL-PRF-83282 at 150 °F (66 °C). Nonconformance to 3.7.6 shall constitute failure of this test.

4.5.19 Recoating. Prepare three steel panels as specified in 4.5.12. Allow the primer to dry 2 hours, 24 hours and 168 hours respectively, then spray each panel with a topcoat of

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Green 383, 34094 polyurethane conforming to MIL-DTL-64159 and MIL-DTL-53039. If necessary, the polyurethane shall be thinned according to the specification with thinner conforming to the specification and sprayed to a dry film thickness of 2 ± 0.2 mils (50 ± 5 microns). After the topcoat has air dried for 168 hours, examine the panels for evidence of lifting. Perform adhesion testing as specified in ASTM D3359, method B. The resultant rating shall be classified as scale 4B or better. The topcoat shall show no evidence of peeling. Nonconformance to 3.7.7 shall constitute failure of this test.

4.5.20 Weather resistance. Prepare two steel panels as specified in 4.5.12. After drying for 24 hours, topcoat all primed panels with Green 383, 34094 as specified in MIL-DTL-64159 type II to a dry film thickness of 2 ± 0.2 mils (50 ± 5 microns). Allow to air dry for a minimum of seven (7) days and record color and 60° gloss readings for each panel. Panels shall be placed outdoors, for the equivalent of 560 megajoule per square meter of total UV irradiance, in an accelerated outdoor exposure according to ASTM G90. At 70 megajoule per square meter intervals examine the panels for compliance with 3.7.8. Determine chalking according to ASTM D4214. Rinse the panels with a warm soap solution using a soft sponge or cloth, rinse, dry and examine for color change at each interval. The exposure racks shall be weathered at latitude $33^\circ 23'$ north and $112^\circ 35'$ west. Nonconformance to 3.7.8 shall constitute failure of this test.

4.5.21 Super tropical bleach (STB) resistance. Prepare a film of primer on steel as specified in 4.5.12. Scribe a one (1) inch diameter wax ring using a china marker on the painted surface of the panel. Place approximately one (1) ml of STB agent on the panel surface. Do not cover. Allow to stand 30 minutes then thoroughly wash with water. A STB slurry mix of 40 parts STB and 60 parts water by weight shall be used. Examine for compliance with 3.7.9.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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

6.1 Intended use. The primer described in this specification is lead and hexavalent chromium free and is intended for use on clean, chemically pretreated metal surfaces in camouflage systems and is compatible with Chemical Agent Resistant Coating (CARC) topcoats. It is a water based epoxy primer that is HAP-free with maximum VOC content of 2.8 lbs/gal (340 g/l) and is compatible with chemical agent resistant aliphatic polyurethane topcoats. The epoxy primer will provide enhanced corrosion performance of 1,008 hours salt spray and 30 cycles on the cyclic

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test. This epoxy primer should not be applied directly to wash primer conforming to DOD-P-15328 or MIL-C-8514. This epoxy primer should not be used on aircraft or any associated components of the aircraft. The proper aircraft primers are either MIL-PRF-23377 or MIL-PRF-85582.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Type of coating (see 1.2).
- c. Part or identifying number (PIN) (see 1.2.1).
- d. Color required (see 3.2).
- e. Size of containers for component A and component B (see 3.4).
- f. Kit size (see 3.4.1)
- g. If a toxicity clearance is required (see 3.9).
- h. Whether a MSDS is required with each shipment (see 3.10 and 4.4.1).
- i. If qualification samples are required and where to send them (see 4.2 and 6.4).
- j. If conformance samples are required and where to send them (see 4.3).
- k. Lot and batch formation (see 4.3.1).
- l. Packaging requirements (see 5.1).

6.3 Basis of purchase. The primers covered by this specification should be purchased by volume, the unit being a kit comprised of 1 quart of 57.75 cubic inches or 1 gallon of 231 cubic inches. The kit components need not be the same size.

6.4 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in the QPD, whether or not such products have actually been so listed by that date. The attention of contractors is called to this requirement and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. Samples for QPD testing (see 4.2) should be submitted to Army Research Laboratory – Weapons and Materials Research Directorate, ATTN: RDRL-WMM-C, Camouflage, Coatings and Corrosion Team, Building 4600, Deer Creek Loop, Aberdeen Proving Ground, MD 21005-5066.

6.4.1 Retention of qualification. In order to retain qualification of a product approved for listing in the QPD, the manufacturer will verify by certification to the qualifying activity that the manufacturer's product complies with the requirements of this specification. Unless otherwise specified, the time of periodic verification by certification will be in two-year intervals from the date of the original qualification, and will be initiated by the qualifying activity. No change will be made in formulation, raw materials or supplier(s) of raw materials, methods of manufacture, equipment, or geographic location without prior written Government approval. The Government reserves the right to re-examine the qualified product whenever deemed necessary to determine that the product continues to meet any or all of the specification requirements.

6.4.2 SDS. Contracting officers will identify those activities requiring copies of a completed SDS prepared in accordance with FED-STD-313. The pertinent Government mailing addresses for submission of data are listed in FED-STD-313.

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6.4.3 Sample identification for qualification inspection. Samples for QPD testing are to be identified in a cover letter with the following information:

Manufacturer's name and product number.

Submitted by (name and date).

Specify the number of samples.

Specify the reason for submitting the samples.

Specification MIL-DTL-53030D Amendment 1; Type_____, Color_____,

“Primer Coating, Epoxy, Water Based, Lead And Chromate Free”.

Provide a copy of the SDS.

Provide a copy of the notarized statement of composition.

Provide a copy of the technical data sheet.

Provide a copy of the test report.

6.4.4 Conformity to qualified sample. All lots of coatings supplied under this specification must be manufactured using the same formulation, raw materials and supplier(s) of raw materials, methods of manufacture, equipment, and geographic location as the qualification sample, unless changes have been approved by the qualifying activity.

6.5 Toxicity request. Department of the Army Regulation (AR) 40-5, Preventive Medicine, (AR) 70-1, Acquisition Policy, and Department of the Army Pamphlet 70-3, Acquisition Procedures, require a toxicity clearance. Army toxicity questions and/or a toxicity clearance request should be addressed to: Commander, US Army Center For Health Promotion And Preventive Medicine, ATTN: MCHB-TS-TTE, 5158 Blackhawk Road, Aberdeen Proving Ground, MD 21010-5403.

6.6 Conformance rejection and retest. Failure in any conformance inspection will result in the rejection of the batch from which it was obtained. Rejected material cannot be resubmitted for acceptance without written approval from the qualification activity (see 4.3). The application for resubmission will contain all details concerning previous rejections and measures taken to correct these deficiencies.

6.7 Cyclic Corrosion Laboratory Test. A properly calibrated cyclic chamber performing GM9540P will, after 40 cycles, cause mass loss in the range of 3712 - 4312 mg on a standardized 3.18 mm thick mass loss coupon. The target range for calibration with respect to GMW14872, Exterior, 4 sprays/cycle, Exposure C is 3660 - 4220 mg at 26 ± 3 cycles on a standardized 3.18 mm mass loss coupon. The congruency of the mass loss ranges given in GM9450P and GMW14872 had led ARL to decide to change the required cycles for accelerated corrosion testing from 40 to 30 cycles for GMW14872. To achieve an equal corrosive environment between the two test methods, the cycles for GMW14872 would be 75% of the requirement that was established for GM9540. This new requirement would be reflected into each CARC pretreatment, primer and application specification as they are amended or revised.

6.8 Detail specification. MIL-DTL-53072, Chemical Agent Resistant Coating (CARC) System Application Procedures and Quality Control Inspection, is available for application procedures and quality control inspection of this coating.

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6.9 Subject term (key word) listing.

Aluminum
Camouflage system
HAP-free
Metals
Panels
Steel
VOC

6.10 Amendment notations. The margins of this specification are marked with vertical lines to indicate modifications generated by this amendment. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations.

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CONCLUDING MATERIAL

Custodians:

Army - MR
Navy - AS
Air Force - 11

Preparing activity:

Army - MR

Project 8010-2017-005

Review activities:

Army - MD1, MI
Navy - CG, SH, MC
Air Force - 84

Civil agency:

GSA/FAS

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil/> .