

MIL-STD-194A (Ord)

20 October 1960

SUPERSEDING

MIL-STD-194 (ORD)

4 October 1955

MILITARY STANDARD

SYSTEMS FOR PAINTING AND FINISHING

FIRE-CONTROL MATERIEL



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1960

MIL-STD-194A (ORD)
20 October 1960

DEPARTMENT OF THE ARMY
ORDNANCE CORPS
WASHINGTON, D. C.

Systems for Painting and Finishing Fire-Control Materiel

MIL-STD-194 A

20 OCTOBER 1960

1. This standard has been approved by the Department of the Army, and is published to establish systems for painting and finishing Ordnance fire-control materiel.
2. Recommended corrections, additions, or deletions should be addressed to Commanding Officer, Frankford Arsenal, Philadelphia 37, Pa.

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FOREWORD

The primary purpose of this standard is to establish minimum painting and finishing requirements for fire-control materiel. The specific requirements recommended in this standard, as applicable, complement the requirements represented by the basic finish-system code numbers in Standard MIL-STD-171 (Ord), Systems for preparation, Painting and Finishing Metal and Wood Surfaces (hereinafter referred to as MIL-STD-171).

The secondary purpose is to establish a cross reference, as applicable, between superseded Specification MIL-P-12011 (Ord) requirements and finish-system numbers and requirements identified in this standard and in MIL-STD-171. Specification MIL-P-12011 was superseded by initial issue of this standard, dated 4 October 1955.

Compliance with this standard will promote uniformity in painting and finishing fire-control materiel.

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1. SCOPE

1.1 SCOPE. This standard establishes minimum requirements for surface preparation, surface treating, painting and finishing of fire control materiel. The requirements in this standard are indicated in relation to basic finish-system code numbers established in MIL-STD-171 which represent basic finish-system requirements also established in MIL-STD-171. MIL-STD-171 forms a necessary part of this standard.

1.2 CROSS REFERENCE BETWEEN SUPERSEDED SPECIFICATION MIL-P-12011 AND THIS STANDARD. This standard establishes a necessary cross-reference between requirements established in this standard and MIL-STD-171 and requirements identified by finish-system numbers specified in the superseded MIL-P-12011 Specification. This cross reference will be used where MIL-P-12011 is specified and this standard and MIL-STD-171 are supplied in place of MIL-P-12011.

1.3 CROSS REFERENCE BETWEEN SUPERSEDED FEDERAL SPECIFICATION

TT-C-595 AND FEDERAL STANDARD 595.

The color numbers in this standard show, where applicable, the color numbers in Federal Standard 595, and in () the corresponding color number in superseded Federal Specification TT-C-595. The number in () is for reference only and shall not be used either in new or revised documents. Use only the five-digit color numbers of Fed. STD-595, as in the example:

Example: Black No. 27038.

1.4 SELECTION AND DESIGNATION OF A FINISH-SYSTEM.

The selection of a particular finish-system as given either in this standard, or in MIL-STD-171, shall be designated on drawings, in contracts, and in item specifications. The choice shall not be left to the manufacturer, supplier or contractor. In designating requirements, complete information should be given, as applicable.

Examples: System No. 21.6 of MIL-STD-171 Black No. 27038, Primer and Finish Coats Baked Finish No. 8.4 of MIL-STD-171.

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2. REFERENCED DOCUMENTS

2.1 REFERENCED DOCUMENTS. The following documents referenced in this standard are of the issue in effect on the date of invitation for bids, and form a part of this standard. This same statement applies to documents listed in tables of Standard MIL-STD-171, Systems for Preparation, Painting, and Finishing Metal and Wood Surfaces, that are applicable to this standard.

SPECIFICATIONS**FEDERAL**

- | | | | |
|----------|--|-----------------|---|
| QQ-C-320 | — Chromium Plating (Electrodeposited). | TT-V-121 | — Varnish; Spar, Water-Resisting. |
| QQ-N-290 | — Nickel Plating (Electrodeposited). | MILITARY | |
| QQ-P-416 | — Plating, Cadmium (Electrodeposited). | JAN-E-480 | — Enamel, Baking; Phenol-or-Urea-Formaldehyde. |
| QQ-S-365 | — Silver Plating (Electrodeposited). | MIL-C-490 | — Cleaning and Preparation of Ferrous and Zinc-Coated Surfaces for Organic Protective Coatings. |
| QQ-Z-325 | — Zinc Plating (Electrodeposited). | MIL-F-495 | — Finish, Chemical, Black, For Copper Alloys. |
| TT-E-485 | — Enamel; Semigloss, Rust-Inhibiting. | MIL-M-3171 | — Magnesium Alloy; Process for Corrosion Protection of. |
| TT-E-489 | — Enamel; Gloss; Synthetic (For Exterior and Interior Surfaces). | MIL-W-3688 | — Wax Emulsion; Rust-Inhibiting. |
| TT-E-527 | — Enamel, Synthetic, Lusterless. | MIL-C-5541 | — Chemical Films for Aluminum and Aluminum Alloys. |
| TT-E-529 | — Enamel, Synthetic, Semigloss. | MIL-E-5558 | — Enamel, Wrinkle, Baking. |
| TT-L-58 | — Lacquer; Spraying, Clear and Pigmented (General Use). | MIL-H-5606 | — Hydraulic Fluid, Petroleum Base, Aircraft and Ordnance. |
| TT-O-369 | — Oil, Linseed, Raw (For Use in Organic Coatings). | MIL-H-6083 | — Hydraulic Fluid, Petroleum Base, Preservative. |
| TT-P-659 | — Primer, Surfacer; Synthetic, Tints and White. | MIL-A-8625 | — Anodic-Coatings, For Aluminum and Aluminum Alloys. |
| TT-P-666 | — Paint; Primer, Zinc-Yellow, For Aluminum and Magnesium Surfaces. | MIL-E-10687 | — Enamel, Lusterless, Quick - Drying (For Ammunition). |
| TT-V-91 | — Varnish; Shellac. | MIL-T-10727 | — Tin Plating, Ferrous and Nonferrous Metals. |
| | | MIL-S-11030 | — Sealing Compound; Noncuring (Polysulfide Base). |
| | | MIL-S-11031 | — Sealing Compound; Adhesive, Curing (Polysulfide Base). |
| | | MIL-L-11195 | — Lacquer, Lusterless, Hot Spray. |

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- MIL-C-13335 — Coating for Magnesium and Magnesium Alloys.
- MIL-S-13518 — Sealer, Surface, Wood Preservative.
- MIL-I-13857 — Impregnation of Metal Castings.
- MIL-L-13808 — Lead Plating.
- MIL-H-13866 — Hydraulic Fluid, Petroleum Base, Artillery Recoil, Special.
- MIL-S-13913 — Stain, Wood, Olive Drab.
- MIL-H-13919 — Hydraulic Fluid, Petroleum Base, Fire Control.
- MIL-C-13924 — Coating, Oxide, Black for Ferrous Metal.
- MIL-P-16232 — Phosphate Coatings, Heavy, Manganese or Zinc Base (For Ferrous Metals).

STANDARDS

FEDERAL

Federal Test Method Standard No. 141—
 Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling, and Testing.

Federal Standard No. 595—Colors.

MILITARY

MIL-STD-171 — Systems for Preparation
 Painting, and Finishing
 Metal and Wood Sur-
 faces.

(Copies of specifications, standards, and color chips required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

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3. DEFINITIONS

3.1 FINISH-SYSTEM CODE NUMBERS. In this standard reference is made to designated finish numbers and system numbers established

in MIL-STD-171. These finish-system numbers are defined in detail in MIL-STD-171.

4. GENERAL REQUIREMENTS

4.1 GENERAL REQUIREMENTS. All of the general requirements in section 4 of MIL-STD-171 shall apply.

4.2 INTERIOR SURFACES OF INSTRUMENTS. Unless otherwise specified, interior surfaces of instruments shall not be painted.

4.3 COLOR CODE FOR THE IDENTIFICATION OF LUBRICATING POINTS, WATER CAPS AND PLUGS, ETC. Colors of enamel for identification purposes, shall closely match the designated colors of Federal Standard 595, as indicated by numbers below. The gloss enamel shall conform to Specification TT-E-489. Areas adjacent to all plugs and caps shall have a 1/4-inch wide band of the required color painted around the neck or hole to avoid loss of identification when replacing lost plugs or caps.

Note. The following numbers, in brackets (), are Specification TT-C-595 color numbers and are for reference only. Do not use them on new or revised documents. Specify the five-digit numbers on all new or revised documents, they are the color numbers specified in Federal Standard 595—Colors.

Item	Color
Water cap.....	White, No. 17875 (1755).
Fuel ¹	Primary, Yellow, No. 13538 (1310). Secondary, Gasoline, White, No. 17875 (1755). Secondary, Diesel, Black, No. 17038 (1770).
Oil filler caps or other lubricant... reservoirs	Blue, No. 15123 (1525).
Drain plugs.....	Yellow, No. 13538 (1310).

¹ Except where one or the other is specifically required, the secondary color may be displayed either by a dot or 1/4-inch diagonal stripe centered on the primary color.

Lubrication fittings and oilcups... Red, No. 11136 (1105).
Open oilholes without plugs..... 1/4-inch Red, No. 11136 (1105) circle around such points, interior diameter of circle to be 1/4 inch from hole.

Filler plugs for recoil mechanisms:

- (a) When using hydraulic... Orange, No. 12197 (1205).
fluid, petroleum base,
aircraft and ordnance
MIL-H-5606.
- (b) When using hydraulic... Green, No. 14187 (1460).
fluid, petroleum
base, artillery, recoil,
special MIL-H-13866.

Filler plugs for hydraulic mechanisms:

- (a) When using hydraulic... Brown, No. 10076 (1020).
fluid, petroleum base,
fire control MIL-H-13919.
- (b) When using hydraulic... Orange, No. 12197 (1205).
fluid, petroleum base,
aircraft and ordnance
MIL-H-5606.
- (c) When using hydraulic... Buff, No. 13594 (1745).
fluid, petroleum base,
preservative MIL-H-6083.

Filler plugs for gaseous..... Gray, No. 16187 (1625).
substances.

4.4 HEADLESS SCREWS. All visible headless screws, except adjusting screws, shall be covered with sealing compound conforming to MIL-S-11030, type I, class I, or MIL-S-11031, whichever is applicable.

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5. DETAIL REQUIREMENTS

5.1 SURFACE PREPARATION AND PRE-TREATMENTS

5.1.1 Wood. Unless otherwise specified, finish 25.3 shall be used for pretreatment of wood prior to painting.

5.1.2 Ferrous metal. All iron and steel surfaces shall be cleaned and phosphatized prior to being painted. The phosphate base coating shall be in accordance with finish No. 5.1. In the event that the part to be treated is too large for available phosphatizing equipment, and where spray phosphatizing is not available, the clean surface shall be given one pretreatment coat according to finish No. 5.2, subject to the approval of the contracting officer, or as otherwise specified.

5.1.3 Treatment of corrosion-resisting steels. After all machining, cleaning, and pickling operations, and prior to applying oxide black coatings, all components made of corrosion-resisting steels covered by Specifications QQ-S-763, QQ-S-766, and MIL-T-8606 tubing, shall be treated in accordance with finish No. 5.4 of MIL-STD-171.

5.1.4 Aluminum and aluminum alloys. Unless otherwise specified, all aluminum surfaces shall be anodically treated in accordance with finish No. 7.2 prior to being finished with organic coatings. If the part to be treated is too large for available anodizing tanks and power equipment, a surface chemical treatment (finish No. 7.3), approved by the contracting officer, shall be applied.

5.1.5 Magnesium and magnesium alloys. Magnesium and magnesium alloy surfaces shall be cleaned by vapor-degreasing, finish No. 4.3, or as otherwise prescribed by the contracting officer. After cleaning, finger-marks, dirt, dust, and other foreign matter shall be kept off the surface. Immediately following cleaning, rigid parts of magnesium and its alloys, including interior surfaces where possible, shall be treated in accordance with finish No. 8.1. Magnesium parts subject to flexing shall be cleaned and

treated in accordance with finish No. 8.5. Treated surfaces which become scratched in handling shall be touched up with finish No. 8.2. The specified paint coating shall be applied immediately after the treated parts are thoroughly dry.

5.1.6 Zinc. Zinc surfaces shall be cleaned by vapor-degreasing, finish No. 4.3, or by any other cleaning method in that standard, as approved by the contracting officer. After cleaning, finger-marks, dirt, dust and other foreign matter shall be kept off the surface. The parts shall then be given a phosphate treatment conforming to finish No. 6.2 prior to being painted. In the event that the part to be treated is too large for available phosphating equipment, finish No. 6.1 or 6.3 may be used, subject to approval by the contracting officer.

5.1.7 Copper and copper alloys. All copper, bronze, and brass surfaces shall be cleaned free from oil, grease, and dirt, and any other foreign matter, and sandblasted (finish No. 9.2) just prior to being painted, unless otherwise specified.

5.1.8 Impregnation of castings. Impregnation of castings shall be done after cleaning and machining operations are completed. Unless otherwise specified, all sand, permanent mold, and die-cast parts forming all or part of the internal surface of housings designed to hold oil, be weatherproof or waterproof, and sand, permanent mold, and die-cast parts contained with the same housing with the optical elements of optical instruments, shall be vacuum impregnated. Aluminum alloy castings shall be impregnated after being anodically treated. Magnesium alloy castings shall be impregnated after cleaning and prior to application of a suitable surface treatment. Upon presentation of proper evidence, impregnation of aluminum alloy may be performed prior to anodic treatment, subject to approval by the procuring activity. The process and impregnant for all castings requiring to be gas or moisture-vapor tight shall be in conformance with Specification MIL-I-13857.

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5.2 SELECTION OF ORGANIC PAINTING AND FINISHING SYSTEMS

Selection of organic painting and finishing systems for fire-control materiel shall be made as applicable from tables I, II, III, and IV of this standard. Do not specify a bake finish on castings previously impregnated because heating can cause the impregnating material to soften. Wrinkle finishes should not be specified for Ordnance materiel because of the difficulty of decontaminating these surfaces of radioactive residue.

5.3 SELECTION OF ELECTROPLATING

Selection of electroplated finishes for fire-control materiel shall be made as applicable from table V of this standard.

5.4 SELECTION OF CHEMICAL IN-ORGANIC FINISHES

Selection of inorganic chemical finishes for fire-control materiel such as oxide black finishes, phosphate finishes, treatments and finishes for aluminum, and treatments and finishes for magnesium shall be made as applicable from tables VI, VII, and VIII of this standard.

5.5 CROSS REFERENCE OF SUPERSEDED MIL-P-12011 FINISH NUMBERS

Table IX of this standard provides a cross reference between requirements established in this standard and MIL-STD-171 and requirements identified by finish-system numbers specified in the superseded MIL-P-12011 specification.

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6. INSPECTION

6.1 INSPECTION. The requirements of section 6, INSPECTION, of Standard MIL-STD-171 shall apply.

Notice. When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the

holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.)

(Copies of specifications, standards, drawings, publications, and color chips required by contractors in connection with specific procurement functions should be obtained from the procuring agency or as directed by the contracting officer.)

(Copies of this standard for military use may be obtained as indicated in the foreword to the Index of Military Specifications and Standards.)

Custodian:

Army—Ordnance Corps

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TABLE 1
Paint Systems for steel surfaces and other metal surfaces
other than aluminum and magnesium

Table Item	Complete Paint System (System No. Defined in MIL-STD-171) (Color No. Defined in Fed. STD No. 595)	Use	How Specified
1.	Semigloss olive drab enamel System No. 21.5 Color - Olive drab No. 24087 (2430) Primer - Baked or air-dried. Finish coat - Baked	For exterior exposure.	SYSTEM No. 21.5 of MIL-STD-171, OLIVE DRAB No. 24087 (2430), PRIMER BAKED* FINISH COAT BAKED *Specify baked or air-dried as required.
2.	Semigloss black enamel System No. 21.6 Color - Black No. 27038 (2710) Primer - Baked or air-dried. Finish coat - Baked	For exterior exposure.	SYSTEM No. 21.6 of MIL-STD-171, BLACK, No. 27038 (2710) PRIMER BAKED* FINISH COAT BAKED *Specify baked or air-dried as required.
3.	Semigloss olive drab enamel System No. 21.16 Color - Olive drab No. 24087 (2430) Primer - Baked. Finish coat - Baked.	For severe exterior exposure. Marine atmosphere.	SYSTEM No. 21.16 of MIL-STD-171, OLIVE DRAB No. 24087 (2430) PRIMER AND FINISH COAT BAKED.
4.	Semigloss black enamel System No. 21.16 Color - Black No. 27038 (2710) Primer - Baked. Finish coat - Baked	For severe exterior exposure. Marine atmosphere	SYSTEM No. 21.16 of MIL-STD-171, BLACK No. 27038 (2710) PRIMER AND FINISH COAT BAKED.
5.	Wrinkle finish olive drab enamel System No. 23.1 Color - Olive drab No. 24087 (2430) Each coat shall be baked.	Instrument finish. Interior or exterior exposure.	SYSTEM No. 23.1 of MIL-STD-171, OLIVE DRAB No. 24087 (2430), EACH COAT BAKED.
6.	Wrinkle finish black enamel System No. 23.2 Color - Black No. 27038 (2710) Each coat shall be baked.	Instrument finish. Interior or exterior exposure.	SYSTEM No. 23.2 of MIL-STD-171, BLACK No. 27038 (2710), EACH COAT BAKED.
7.	Semigloss white enamel System No. 21.6 Color - White No. 27875 Primer - Baked. Finish coat - Baked or air-dried.	For exterior exposure.	SYSTEM No. 21.6 of MIL-STD-171, WHITE, No. 27875 PRIMER BAKED, FINISH COAT BAKED* *Specify baked or air-dried as required.
8.	Semigloss oil resistant enamel System No. 21.7 Each coat shall be baked	For steel surfaces in oil housings	SYSTEM No. 21.7 of MIL-STD-171, Specify desired color
9.	Lusterless black enamel System No. 20.11 Color - Black No. 37038 (3725) Each coat shall be baked.	For interior metal surfaces (optical instruments)	SYSTEM No. 20.11 of MIL-STD-171, BLACK No. 37038 (3725), EACH COAT BAKED.
10.	Lusterless black enamel (Fast drying) System No. 20.1 Color - Black No. 37038 (3725) The enamel shall be air-dried.	Fast drying. Applications on interior metal surfaces.	SYSTEM No. 20.1 of MIL-STD-171, BLACK No. 37038 (3725)

NOTE: All numbers in brackets () in the above table are TS-C-595 color numbers, and are for reference only. DO NOT use them on new or revised documents. Specify the five digit numbers on all new or revised documents, they are the color numbers specified in Federal Standard No. 595 Colors.

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TABLE II
Paint systems for aluminum and magnesium surfaces

Table Item	Complete Paint system (System No. Defined in MIL-STD-171) (Color No. Defined in Fed-STD-595)	Use	How Specified
1.	Semigloss olive drab enamel System No. 21.5 using TT-P-666 vino yellow primer. Color - Olive drab No. 24087 (2430) Primer - Baked. Finish coat - air-dried or baked.	For exterior exposure.	SYSTEM No. 21.5 of MIL-STD-171, USING TT-P-666 ZINC YELLOW BAKED PRIMER, OLIVE DRAB No. 24087 (2430) AIR-DRIED* FINISH COAT *Specify air-dried or baked as required.
2.	Semigloss black enamel System No. 21.6 using TT-P-666 vino yellow primer. Color - Black No. 27038 (2710) Primer - Baked. Finish coat - air-dried or baked.	For exterior exposure.	SYSTEM No. 21.6 of MIL-STD-171, USING TT-P-666 ZINC YELLOW BAKED PRIMER, BLACK No. 27038 (2710) AIR-DRIED* FINISH COAT *Specify air-dried or baked as required.
3.	Semigloss white enamel System No. 21.6 using TT-P-666 vino yellow primer. Color - White. No. 27875 Primer - Baked. Finish coat - air-dried or baked.	For exterior exposure.	SYSTEM No. 21.6 of MIL-STD-171, USING TT-P-666 ZINC YELLOW BAKED PRIMER, WHITE No. 27875 AIR-DRIED* FINISH COAT. *Specify air-dried or baked as required.
4.	Semigloss oil resistant enamel System No. 21.7 using TT-P-666 vino yellow primer. Each coat shall be baked.	For use on metal surfaces in oil housings.	SYSTEM No. 21.7 of MIL-STD-171, USING TT-P-666 ZINC YELLOW PRIMER, ALL COATS BAKED SPECIFY DESIRED COLOR
5.	Wrinkle finish olive drab enamel System No. 23.4 Color - Olive drab No. 24087 (2430) (intermediate and top coats). Each coat shall be baked.	Instrument finish, Interior or exterior exposure.	SYSTEM No. 23.4 of MIL-STD-171, OLIVE DRAB No. 24087 (2430) INTERMEDIATE AND TOP COATS. ALL COATS BAKED.
6.	Wrinkle finish black enamel System No. 23.5 Color - Black No. 27038 (2710) (intermediate and top coats). Each coat shall be baked.	Instrument finish, Interior or exterior exposure.	SYSTEM No. 23.5 of MIL-STD-171, BLACK No. 27038 (2710) INTERMEDIATE AND TOP COATS. ALL COATS BAKED.
7.	Laquer finish System No. 21.18.	For surfaces of aluminum plotting boards.	SYSTEM No. 21.18 of MIL-STD-171, Specify desired color

NOTE: All numbers in brackets () in the above table are TT-4-595 color numbers and are for reference only. DO NOT use them on new or revised documents. Specify the five digit numbers on all new or revised documents, they are the color numbers specified in Federal Standard 595 Colors.

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TABLE III
Paint Systems for Wood Surfaces

Table Item	Complete Paint System (System No. Defined in MIL-STD-171) (Color No. Defined in Fed. STD-595)	Use	How Specified
1.	Semigloss olive drab enamel System No. 27.3 Color - Olive drab No. 24087 (2430) Primer - Air-dry for 6 hrs. Top coat - Air-dry for 18 hrs.	For exterior or interior exposure.	SYSTEM No. 27.3 of MIL-STD-171, OLIVE DRAB No. 24087 (2430), PRIMER AIR-DRIED 6 HRS TOP COAT AIR DRIED 18 HRS.
2.	Semigloss white enamel System No. 27.2 Color - White, No. 27875 Primer - Air-dry for 6 hrs. Top coat - Air-dry for 18 hrs.	For exterior or interior exposure.	SYSTEM No. 27.2 of MIL-STD-171, WHITE, No. 27875 PRIMER AIR-DRIED 6 HRS, TOP COAT AIR-DRIED 18 HRS.
3.	Olive drab stain System No. 29.1	For exterior or interior exposure.	SYSTEM No. 29.1 of MIL-STD-171
4.	Spar varnish finish - Natural System No. 28.3 Air-dry for 6 hrs. between coats.	For exterior or interior exposure	SYSTEM No. 28.3 of MIL-STD-171, AIR-DRIED 6 HRS. BETWEEN COATS
5.	Lacquer finish - Natural System No. 28.4	For exterior or interior exposure.	SYSTEM No. 28.4 of MIL-STD-171
6.	Orange shellac varnish finish System No. 28.5	-----	SYSTEM No. 28.5 of MIL-STD-171* *Specify Type, Grade, and Body as required.
7.	Spar varnish finish for plotting boards System No. 29.2	Clear varnish finish for bottom surface of wood plotting boards.	SYSTEM No. 29.2 of MIL-STD-171
8.	Clear lacquer finish for plotting boards System No. 29.3	Clear lacquer finish for top surface of wood plotting boards.	SYSTEM No. 29.3 of MIL-STD-171
9.	White lacquer finish for plotting boards System No. 29.4	White lacquer finish for top surface of wood plotting boards.	SYSTEM No. 29.4 of MIL-STD-171

NOTE: All numbers in brackets () in the above table are TT-C-595 color numbers, and are for reference only. DO NOT use them on new or revised documents. Specify the five digit numbers on all new or revised documents, they are the color numbers specified in Federal Standard No. 595 Colors.

TABLE IV. GRADUATION FINISHES
Graduation Filler in Accordance with Frankford Arsenal
Purchase Description FED-1633

Table Item	Color and Type System No. Defined in MIL-STD-171	How Specified
1.	Black System No. 30.1.1 (a) (crayon type)	SYSTEM No. 30.1.1 (a) of MIL-STD-171 FED-1633 FILLER
2.	Black System No. 30.1.2 (a) (paste type)	SYSTEM No. 30.1.2 (a) of MIL-STD-171 FED-1633 FILLER
3.	Deep red System No. 30.1.1 (b) (crayon type)	SYSTEM No. 30.1.1 (b) of MIL-STD-171 FED-1633 FILLER
4.	Deep red System No. 30.1.2 (b) (paste type)	SYSTEM No. 30.1.2 (b) of MIL-STD-171 FED-1633 FILLER
5.	White System No. 30.1.1 (c) (crayon type)	SYSTEM No. 30.1.1 (c) of MIL-STD-171 FED-1633 FILLER
6.	White System No. 30.1.2 (c) (paste type)	SYSTEM No. 30.1.2 (c) of MIL-STD-171 FED-1633 FILLER
7.	Translucent white System No. 30.1.1 (d) (crayon type)	SYSTEM No. 30.1.1 (d) of MIL-STD-171 FED-1633 FILLER
8.	Translucent white System No. 30.1.2 (d) (crayon type)	SYSTEM No. 30.1.2 (d) of MIL-STD-171 FED-1633 FILLER

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TABLE V
ELECTROPLATED FINISHES

Table Item	Basic Plating Metal with Basic Finish No. Finish No. defined in MIL-STD-171. See MIL-STD-171 for specific finish numbers for specific types or classes	How Specified *Use appropriate finish numbers
1.	Cadmium Basic Finish No. 1.1 using Specification QQ-P-416	FINISH No. 1.1.1.1* of MIL-STD-171
2.	Chromium Basic Finish No. 1.2 using Specification QQ-C-320	FINISH No. 1.2.1.1* of MIL-STD-171
3.	Lead Basic Finish No. 1.3	FINISH No. 1.3.1.1* of MIL-STD-171
4.	Nickel Basic Finish No. 1.4	FINISH No. 1.4.1.3* of MIL-STD-171
5.	Black chromium Basic Finish No. 1.5 (No current applicable specification)	FINISH No. 1.5. of MIL-STD-171
6.	Black nickel Basic Finish No. 1.6 (No current applicable specification)	FINISH No. 1.6 of MIL-STD-171
7.	Silver Basic Finish No. 1.7	FINISH No. 1.7.1* of MIL-STD-171
8.	Tin Basic Finish No. 1.8	FINISH No. 1.8.1 of MIL-STD-171
9.	Zinc Basic Finish No. 1.9	FINISH No. 1.9.1.1* of MIL-STD-171
10.	Copper No finish number in MIL-STD-171 (No specification) Anticipated number 1.10	Specify as copper plating. Copper usually part of a system for other plating.
11.	Black molybdenum No finish number in MIL-STD-171 (No specification) Anticipated number 1.11	Specify as black molybdenum plating.

TABLE VI
INORGANIC FINISHES, CHEMICAL

Table Item	Finish Finish No. defined in MIL-STD-171	Use	How Specified: Specify only when used alone and not inherent in a specific system number
1.	Molybdate black Finish No. 3.1 (No Specification)	For zinc and cadmium.	FINISH No. 3.1 of MIL-STD-171
2.	Oxide black Finish No. 3.2	For copper alloys. For decorative or corrosive retardant purposes. As a base for lacquer coatings.	FINISH No. 3.2 of MIL-STD-171
3.	Oxide black Basic Finish No. 3.3. See MIL-STD-171 for classes and grades.	For iron and steel. For blackening steel surfaces with a very thin coating.	FINISH No. 3.3.2* of MIL-STD-171 *Specify appropriate number.
4.	Phosphate base coating Finish No. 5.1.	Pretreatment for ferrous and zinc coated surfaces to be organic coated.	FINISH No. 5.1 of MIL-STD-171
5.	Phosphate coatings Basic Finish No. 5.3. See MIL-STD-171 for class and grades and specific uses	For iron and steel	FINISH No. 5.3.1* of MIL-STD-171 *Specify appropriate number.

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TABLE VII
Treatments and finishes for aluminum surfaces

Table Item	Finish Finish No. defined in MIL-STD-171	Use	How Specified Specify only when used alone and not inherent in a specific system number
1.	Anodic coatings Basic Finish No. for chromic acid coatings 7.1. Basic Finish No. for sulfuric acid coatings 7.2. See MIL-STD-171 for finish numbers for dyed and nondyed	Corrosion protection under severe service conditions or as a base for paint.	FINISH No. 7.1.2* of MIL-STD-171 *Specify appropriate number plus word "dyed" and color where dyed coatings are required.

TABLE VIII
Treatments and finishes for magnesium surfaces

Table Item	Finish Finish No. defined in MIL-STD-171	Use	How Specified Specify only when used alone and not inherent in a specific system number
1.	HAE Process Basic Finish No. 8.1. See MIL-C-13335 for classes.	Corrosive, abrasion and thermal resistance. Do not use on parts subject to flexing.	FINISH No. 8.1 of MIL-STD-171, CLASS 1*. *Specify appropriate class indicated in specifications.
2.	Chrome pickle Finish No. 8.2.	Provides increased corrosion resistance, and a suitable base for painting. Use on parts subject to flexing.	FINISH No. 8.2 of MIL-STD-171
3.	Sealed chrome pickle Finish No. 8.3.		FINISH No. 8.3 of MIL-STD-171
4.	Dichromate treatment Finish No. 8.4		FINISH No. 8.4 of MIL-STD-171
5.	Galvanic anodizing Finish No. 8.5.		FINISH No. 8.5 of MIL-STD-171

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TABLE IX

Superseded Specification MIL-P-12011 Finish Numbers cross referenced to MIL-STD-171 numbers, and this standard

Superseded MIL-P-12011 No.	Requirements under superseded MIL-P-12011 No.	MIL-STD-171 number and remarks
19.01	Prime coat, Specification TT-E-485, for metal surfaces except aluminum and magnesium.	Part of paint systems such as 20.11; 21.5; 21.6; 21.7; 23.1; and 23.2.
19.02	Zinc yellow primer, Specification TT-P-666 for aluminum and magnesium.	Part of certain paint systems for metals and used in lieu of Specifications TT-E-485, TT-P-636, TT-P-644, and TT-P-659 primers in priming aluminum and magnesium.
19.03	Prime coat enamel, Specification TT-E-485, for wood.	Used in System No. 27.3.
19.04	Olive drab stain, Specification MIL-S-13913, for wood.	Part of System No. 29.1.
19.05	Wood preservative, Specification MIL-S-13528, Type II.	Part of Finish Nos. 25.1; 25.2; and 25.3.
19.06	Shellac sealer, Specification TT-V-91, for wood.	Part of System Nos. 29.2; 29.3; 29.4; and 29.5.
19.07	Linseed oil prime coat, Specification TT-O-368, for wood.	Part of System Nos. 29.2; 29.3 and 29.4.
19.08	Lusterless enamel topcoat, Specification MIL-E-11237.	Replaces by TT-E-527 as topcoat for System Nos. 20.7; 20.8; 20.11 and 26.2.
19.09	Semi-gloss enamel top coat, Specification MIL-E-11857, for all colors except olive drab. For olive drab Specification TT-E-485.	MIL-E-11857 replaced by TT-E-529 as a top coat for certain systems. TT-E-485 olive drab is a topcoat for certain systems.
19.10	Wrinkle enamel topcoat, Specification MIL-E-5558 for metals.	Topcoat for Systems Nos. 23.1; 23.2; 23.3; 23.4; and 23.5.
19.11	Enamel gloss topcoat, Specification TT-E-489.	Topcoat for System Nos. 22.1; 22.2; 28.1 and 28.2.
19.12	Lusterless enamel topcoat, Specification MIL-E-10687.	Topcoat for System Nos. 20.1; 20.3 and 20.5.
19.14	Gloss varnish topcoat, Specification TT-V-121.	Part of System Nos. 29.1; 29.2; 29.5 and 29.6.
19.15	Wax topcoat, Specification MIL-W-3688.	Part of System No. 29.1.
19.16	White graduation filler.	Crayon type: System No. 30.1.1 (c); Paste type: System No. 30.1.2 (c); Frankford Arsenal Purchase Description FED-1633.
19.17	Black graduation filler.	Crayon type: System No. 30.1.1 (a); Paste type: System No. 30.1.2 (a); Frankford Arsenal Purchase Description FED-1633.
19.18	Deep red graduation filler.	Crayon type: System No. 30.1.1 (b); Paste type: System No. 30.1.2 (b); Frankford Arsenal Purchase Description FED-1633.
19.19	Translucent white graduation filler.	Crayon type: System No. 30.1.1 (d); Paste type: System No. 30.1.2 (d); Frankford Arsenal Purchase Description FED-1633.
19.20	Clear lacquer topcoat, Specification TT-L-46.	Topcoat for System Nos. 28.4 and 29.3.
19.21	Semigloss lacquer, Specification MIL-L-11195.	Topcoat as part of certain paint systems for metals.
19.22	Semigloss enamel topcoat, Specification JAN-C-480.	Topcoat for System No. 21.7.
20.01	Semigloss olive drab for all exterior metal surfaces except aluminum and magnesium.	Replaced by System in table item 1 of Table I, this Standard.
20.02	Semigloss olive drab where extremely high rustproofing of steel is required.	Replaced by System in table item 3, of Table I, this Standard.
20.03	Semigloss olive drab for aluminum and magnesium.	Replaced by System in table item 1 of Table II, this Standard.
20.04	Semigloss olive drab for wood.	Replaced by System in table item 1 of Table III, this Standard.
20.05	Olive drab for wood.	Replaced by System in table item 3 of Table III, this Standard.
20.06	Semigloss olive drab for all metals except aluminum and magnesium.	Replaced by System in table item 1 of Table I, this Standard.
20.07	Semigloss olive drab for aluminum and magnesium.	Replaced by System in table item 1 of Table II, this Standard.
20.08	Semigloss olive drab for wood.	Replaced by System in table item 1 of Table III, this Standard.
20.09	Semigloss black for all exterior metal surfaces except aluminum and magnesium.	Replaced by System in table item 2 of Table I, this Standard.
20.10	Lusterless black for all interior metal surfaces, except aluminum and magnesium (Optical Instruments).	Replaced by System in table item 9 of Table I, this Standard.

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TABLE IX (Cont'd)

Superseded MIL-P-12011 No.	Requirements under superseded MIL-P-12011 No.	MIL-STD-171 number and remarks
20.11	Lusterless black for all interior metal surfaces except aluminum and magnesium (fast drying applications).	Replaced by System in table item 10 of Table I, this Standard.
20.12	Semi-gloss black where extremely high rustproofing is required.	Replaced by System in table item 4 of Table I, this Standard.
20.13	Semi-gloss black for aluminum and magnesium.	Replaced by System in table item 2 of Table II, this Standard.
20.14	Semi-gloss black for all metal surfaces except aluminum and magnesium.	Replaced by System in table item 2 of Table I, this Standard.
20.15	Semi-gloss black for aluminum and magnesium.	Replaced by System in table item 2 of Table II, this Standard.
20.16	Olive drab wrinkle finish for all exterior metal surfaces except aluminum and magnesium.	Replaced by System in table item 5 of Table I, this Standard.
20.17	Olive drab wrinkle finish for aluminum and magnesium.	Replaced by System in table item 5 of Table II, this Standard.
20.18	Black wrinkle finish for all exterior metal surfaces except aluminum and magnesium.	Replaced by System in table item 6 of Table I, this Standard.
20.19	Black wrinkle finish for aluminum and magnesium.	Replaced by System in table item 6 of Table II, this Standard.
20.20	Graduation finish, white.	Replaced by table item 5 and 6 of Table IV, this Standard.
20.21	Graduation finish, black.	Replaced by table item 1 and 2 of Table IV, this Standard.
20.22	Graduation finish, deep red.	Replaced by table item 3 and 4 of Table IV, this Standard.
20.23	Graduation finish, translucent white.	Replaced by table item 7 and 8 of Table IV, this Standard.
20.24	White enamel for all metal surfaces except aluminum and magnesium.	Replaced by table item 7 of Table I, this Standard.
20.25	White enamel for aluminum and magnesium.	Replaced by table item 3 of Table II, this Standard.
20.26	White enamel for wood.	Replaced by table item 2 of Table III, this Standard.
20.27	Varnish for wood - natural.	Replaced by System in Table item 4 of Table III, this Standard.
20.28	Clear lacquer for wood - natural.	Replaced by System in table item 5 of Table III, this Standard.
20.29	Varnish for wood bottom surface of plotting boards.	Replaced by System in table item 7 of Table III, this Standard.
20.30	Varnish for wood top surface of plotting boards - natural.	Replaced by System in table item 8 of Table III, this Standard.
20.31	White lacquer for wood top surface of plotting boards.	Replaced by System in table item 9 of Table III, this Standard.
20.32	Orange gum shellac varnish for wood.	System No. 28.5 using type II, Grade A of Specification II-V-91.
20.33	Oil resistant enamel for all metal surfaces (except aluminum and magnesium) in oil housings.	Replaced by System in table item 8 of Table I, this Standard.
20.34	Oil resistant enamel for aluminum and magnesium metal surfaces in oil housings.	Replaced by System in table item 4 of Table II, this Standard.
20.35	For surfaces of aluminum plotting boards.	Replaced by System in table item 7 of Table II, this Standard.
21.01 Class MS	Cadmium plating for ferrous and nonferrous metals	1.1.1.1*
21.01 Class OS		1.1.1.2*
21.01 Class TS		1.1.1.3*
21.01 Class MSC		1.1.2.1*
21.01 Class MCG		1.1.2.2*
21.01 Class TSC		1.1.2.3*
		*Specification QQ-P-146 in MIL-STD-171 for Finish No. 1.1 should be Specification QQ-P-146. Class A, B, and C, should be Class 1, 2 and 3 respectively.

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TABLE II (Cont'd)

Superseded MIL-F-12011 No.	Requirements under superseded MIL-F-12011 No.	MIL-STD-171 number and remarks
21.02 Class FS	Decorative chromium plating for ferrous and nonferrous metals. *Specification QQ-C-320 in MIL-STD-171 for Finish No. 1.2 should be Specification QQ-C-320.	1.2.1.1*
21.02 Class FS		1.2.1.1*
21.02 Class GS		1.2.1.1*
21.03	Service chromium plating for ferrous and nonferrous metals. *Specification QQ-C-320 in MIL-STD-171 for Finish No. 1.2 should be Specification QQ-C-320.	1.2.2*
21.04	Copper plating for ferrous and nonferrous metals.	No specification requirements for copper as final plating. Usually used as an undercoat for other plates. Copper undercoat requirements are in other plating specifications. Example: QQ-N-29, Nickel Plating (Electrodeposited).
21.05 Class ES	Lead plating for ferrous metals.	1.3.1.1
21.05 Class ES		1.3.1.2
21.05 Class FS		1.3.1.3
21.05 Class EES		1.3.2.1
21.05 Class MS		1.3.2.2
21.05 Class PS		1.3.2.3
21.06 Class FS		Nickel plating for ferrous metals.
21.06 Class FS	1.4.1.3	
21.06 Class GS	1.4.1.4	
21.07	Black molybdenum	No specification. No system number.
21.08	Black Nickel	1.6 No specification
21.09 Matte	Silver plating	1.7.1
21.09 Semi bright		1.7.2
21.09 Bright		1.7.3
21.10	Tin plating, electrodeposited	1.8.1
21.11 Class GS	Zinc plating	1.9.1.1
21.11 Class LS		1.9.1.2
21.11 Class RS		1.9.1.3
21.11 Class GSC		1.9.2.1
21.11 Class LSC		1.9.2.2
21.11 Class RTC		1.9.2.3
22.01	Molybdate black for zinc and cadmium. No specification - produced by immersing in solution containing ammonium molybdate and ammonium hydroxide.	3.1
22.02 Class A	Phosphate for steel	5.3.1
22.02 Class B		5.3.3

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TABLE IX (Cont'd)

Superseded MIL-P-12011 No.	Requirements under superseded MIL-P-12011 No.	MIL-STD-194A number and remarks
22.02 Class C	Phosphate for steel	5.1
22.02 Class D		No specification. No system number.
22.02 Class B plus black dye		5.3.4
22.03 Class A	Oxide black for copper and copper alloys	3.2
22.03 Class B		
22.03 Class C		
22.03 Class D		
22.04 Grade 1	Oxide black for steel *Specification MIL-C-13924 shall be used instead of MIL-P-13924. Class 1 plus the supplementary finish indicated under the pertinent grade for this number.	*3.3.1.1
22.04 Grade 2		*3.3.1.2
22.04 Grade 3		*3.3.1.3
22.05 Grade 1	Oxide black for stainless steels *Use Specification MIL-C-13924 instead of MIL-P-13924.	*3.3.2
22.05 Grade 2		*3.3.3
23.01	Non-dyed anodic film for aluminum (chromic acid)	7.1.1
23.02	Dyed anodic film for aluminum (chromic acid)	7.1.2
23.03	Anodic films for aluminum (sulfuric acid) hot water seal.	7.2
23.04	Anodic films for aluminum (sulfuric acid) bichromate seal.	7.2.1
23.05	Anodic black dye, nickel acetate seal, bichromate seal.	7.2.2 specify color
23.06	Chrome pickle for magnesium	8.2
23.07	Chrome pickle seal for magnesium	8.3
23.08	Acid dichromate for magnesium	8.4
23.09	Alkaline dichromate for magnesium *No specification. Dow Treatment No. 8.	*Not covered.
23.10	Galvanic anodize for magnesium	8.5
23.11	Chrome Alum for magnesium *No specification. Dow Treatment No. 4.	*Not covered.
23.12	Modified alkaline dichromate for magnesium	Not defined.
23.13	RAE Process for magnesium. *Class 1 - No supplementary treatment *Class 2 - With supplementary treatment	*8.1
24.03	Thermosetting resin for impregnation of castings.	MIL-I-13657 Type 1
25.01	Treatment for corrosion resisting steel covered by QQ-S-763, QQ-S-766 and MIL-T-8606 tubing.	See paragraph 5.1.3, this Standard.
26.01	Hydrogen embrittlement relief treatment for steel. After the application of electrodeposits of cadmium, copper, chromium, nickel or zinc: Take at 350 °F to 400°F for at least one hour prior to being put in service. Facitors over one square inch in cross-section shall be baked at 350°F to 400°F for one hour for each square inch of cross-section. Where the electrodeposit is to be given a supplemental finish, such as a chromate treatment, the hydrogen embrittlement relief bake shall be performed directly after the plating operation and before applying supplemental treatment. Where multi-plated metal coatings are used, only one baking treatment shall be given in every case after the final electrodeposit has been applied.	Not specifically covered by number. Part of certain finish or system numbers. Covered in pertinent plating specifications. If not covered in specification or coverage not applicable, or applicable rate covering an appropriate treatment should be specified.