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July 23, 1974
SUPERSEDING
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December 20, 1965

# FEDERAL SPECIFICATION

## SEALER, SURFACE, VARNISH TYPE, FLOOR WOOD AND CORK

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

### 1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers varnish type floor sealer.

1.2 Classification.

1.2.1 The floor sealer shall be of the following classes:

Class 1 - Minimum nonvolatile content 40 percent.
Class 2 - Minimum nonvolatile content 28 percent.

### 2. APPLICABLE DOCUMENTS

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

Federal Specification:

P-W-155 - Wax, Floor, Water-Emulsion, Slip-Resistant.
P-W-158 - Wax, General Purpose, Solvent Type.
TT-F-366 - Filler, Wood Paste.
TT-L-563 - Ink, Writing, For Fountain and Dip Pens.
TT-P-143 - Paint, Varnish, Lacquer and Related Materials; Packaging, Packing, and Marking Of.

Federal Standards:

Fed. Test. Method Std. No. 141 - Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling, and Testing.

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

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

(Federal Government activities many obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards

from established distribution points in their agencies.)

Military Standards:

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.

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

FSC 8010

## 3. REQUIREMENTS

3.1 Material. The manufacturer is given wide latitude in selection of raw materials and processes of manufacture provided that the sealer meets all the requirements specified herein.

3.2 Composition.

3.2.1 The sealer shall contain commercially available resin, oil, drier and thinner.

3.2.2 Thinner. The thinner used shall comply to the following requirements by volume:

(a) Aromatic compounds with eight or more carbon atoms except ethyl benzene: 8 percent maximum.
(b) Ethyl benzene and toluene: 20 percent maximum.
(c) Solvents with olefinic or cylo-olefinic type of unsaturation: negative test.
(d) Ketones (branched chain): negative test.
(e) Total of (a) plus (b): 20 percent maximum.

3.3 Qualitative requirements.

3.3.1 Condition in container. The sealer when tested as in 4.3.2, shall be free of grit, seeds, skins, lumps, thickening, or livering and shall show no hard caking than cannot be readily reincorporated to a smooth homogeneous state.

3.3.2 Storage stability.

3.3.2.1 Partially full container. The sealer shall show no skinning when tested as in 4.3.3.1. After aging as specified in 4.3.3.1, the sealer shall show no livering, curdling, hard caking or gummy sediment. It shall mix readily to a smooth homogeneous state.

3.3.2.2 Full container. The sealer shall show no skinning, livering, hard and dry caking, or tough, gummy sediment when tested as in 4.3.3.2 and shall remix readily to a smooth homogeneous state.

3.3.3 Dilution stability. When thinned as in 4.3.4, the sealer shall remain stable and uniform showing no precipitation, curdling, or separation. Slight pigment settling shall be permitted.

3.3.4 Working properties. Sealer shall be sufficiently fluid to permit application with a bristle brush or lamb’s wool mop and shall be capable of being thinned with mineral spirits. Sealer applied as specified in 4.3.5 shall satisfactorily seals the pores of the wood by absorption, leaving no apparent surface film, and shall provide a satisfactory foundation for a finishing material such as varnish, paste wax or water emulsion wax.

3.3.5 Odor. The odor shall not be putrid or otherwise offensive or irritating before, during and after application when tested as in 4.3.6. There shall be no residual odor after 24 hours of air drying.

3.3.6 Water resistance. When tested as in 4.3.7, the dried film of the sealer shall show no whitening, blistering, flaking or other visible defects. Only slight dulling is permissible.

3.4 Quantitative requirements.

3.4.1 The quantitative requirements shall be as specified in table I.

TABLE I. Quantitative requirements

| Characteristics | Requirements | |
|---|---|---|
| | Minimum | Maximum |
| Viscosity, Garner-Holdt tube: | | |
| Class 1 | --- | C |
| Class 2 | --- | A2 |
| Nonvolatile, percent by weight of sealer: | | |
| Class 1 | 40 | --- |
| Class 2 | 28 | --- |
| Drying time: | | |
| Set to touch, hours | 1 | 2 |
| Dry hard, hours | --- | 3- |
| Free from after tack | --- | 4-1/2 |
| Color, Gardner color standards | --- | 13 |
| Flash point, (deg. F.) | 100 | --- |

4. QUALITY ASSURANCE PROVISIONS

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

4.2 Sampling and inspection. Unless otherwise specified, sampling and inspection of sealer shall be in accordance with method 1031 of Fed. Test Method Std. No. 141.

4.2.1 Classification of inspection. Inspection shall be classified as follows:

(a) Production inspection of the sealer.
(b) Inspection of preparation for delivery (see 4.).

4.3 Test procedures.

4.3.1 The following test shall be conducted in accordance with Fed. Test Method Std. No. 141, except as otherwise specified herein.

TABLE II. Index

| Characteristics | Requirements Reference | Applicable Test Methods Fed. Test Method Std. No. 141 | Paragraph Reference |
|---|---|---|---|
| Viscosity | Table I | 4271 | ---- |
| Nonvolatile vehicle | Table I | 4041 | ---- |
| Drying time | Table I | 4061.1 | ---- |
| Color | Table I | 6121 | ---- |
| Flash point | Table I | 4291 | ---- |
| Condition in container | 3.3.1 | 3011.1 | 4.3.2 |
| Storage stability | 3.3.2 | ---- | 4.3.3 |
| Dilution stability | 3.3.3 | ---- | 4.3.4 |
| Working properties | 3.3.4 | ---- | 4.3.5 |
| Odor | 3.4.5 | 4401 | 4.3.6 |
| Water resistance | 3.4.6 | ---- | 4.3.7 |

4.3.2 Condition in container. Determine package condition of the sealer in accordance with method 3011 of Fed. Test Method Std. No. 141, and evaluate for compliance with 3.4.1. Reseal and then agitate the can for 3 minutes on a paint shaker. On reexamination of the content, the disclosure of gel bodies, undispersed pigment, or unsatisfactory settling properties is cause for refection.

4.3.3 Storage stability.

4.3.3.1 Partially full container. In accordance with method 3022 of Fed. Test Method Std. No. 141, allow a full standard quart can of the sealer to stand undisturbed for one year and then examine the contents. Evaluate pigment settling or caking, but agitate the can for 5 minutes on the paint shaker prior to reexamination. Make other applicable tests for compliance

with 3.4.2.2. A certification from the manufacturer to this effect is acceptable.

4.3.4 Dilution stability. Reduce one part by volume of sealer to one part by volume of mineral spirits. Then test in accordance with method 4203 of Fed. Test Method Std. No. 141, for compliance with 3.4.3.

4.3.5 Working properties. Apply the sealer to four properly sanded (with a No. 00 garnet paper) maple wood panels, with a pad of clean cheesecloth, applying a fairly liberal coat. Note fluidity and ease of application. Permit the sealer to set 15 minutes for absorption into the surface of the wood. Wipe off the excess sealer removed in this manner can be wiped readily and cleanly from the surface. Leave the surface free from all excess sealer. Let dry for 24 hours at a temperature between 21 deg. and 32 deg. C. (70 deg. to 90 deg. F.). Then apply a second coat of sealer in accordance with the procedures indicated above. Let dry for 24 hours. Examine the panels as treated for the presence of surface film. Note whether the treated surface of the panel has a soft, even sheen, and whether the grain of the wood is clouded or obscured. Place several drops of blueblack writing ink (TT-I-563), on the surface of one of the treated panels at various places, and allow to

remain for 3 minutes. After taking up the ink with a piece of blotting paper and wiping the spots lightly with a damp cloth, examine for any indication of the presence of ink. Simulate on another of the treated panels, a worn area, by rubbing the surface with No. 0 steel wool. Over this area apply a thin coat of the sealer. Burnish this area immediately after application of the sealer with No. 00 steel wool. When dry, determine if the treated area blends with the surface of the panel without showing any signs of lap marks. Take the remaining two treated panels and apply to one floor wax, type II of (P-W-158), and to the other, water emulsion floor wax (P-W-155). Note whether the properties of the finishing material are adversely affected by the sealed surface.

4.3.6 Odor. Test for odor in accordance with method 4401 of Fed. Test Method Std. No. 141, and observe for compliance with 3.4.6.

4.3.7 Water resistance. Tin panels used in this test shall be prepared in accordance with method 2012 of Fed. Test Method Std. No. 141, except that they shall not be buffed. The sealer shall be applied by pouring approximately 15 milliliters of the material under test, across the panel near the upper edge, while the panel is lying flat. The panel is then tilted so as to allow the coating to spread over all but the upper edge and is then placed in an almost vertical position and allowed to drain. The panel is then air-dried for 48 hours in accordance with section 7 of Fed. Test Method Std. No. 141. Water resistance shall be tested in accordance with the following in a beaker:

| Water temperature | Immersion time (hours) |
|---|---|
| Room (77 deg. F.) | 24 |
| Boiling point (212 deg. F.) | 0.5 |

The end of each panel which was uppermost during the drying period shall be immersed in the water. After the specified immersion period, each panel shall be removed from the water and any surface material such as slime or scum removed by lightly sponging with a pad of cheesecloth or cotton. Each panel shall be dried for 2 hours and then the sealer film shall be examined. The sealer film shall show no whitening, not more than a very slight dulling, and no other visible defects. Should there be difficulty in evaluating the results on the tin panels, check determinations shall be made on what is known commercially as black carrara glass, one side of which has been polished to a smooth surface. These panels shall be thoroughly cleaned with a suitable solvent immediately before using.

4.3.8 Inspection of preparation for delivery. The packaging, packing, and marking of the sealer shall be inspected. To determine conformance to the requirements of section 5 of this specification.

## 5. PREPARATION FOR DELIVERY

5.1 Packaging, packing, and marking. The sealer shall be packaged, packed, and marked in accordance with TT-P-143. The level of packaging shall be level A, B, or C, and the level of packing shall be level A, B, or C as specified (see 6.2). The paint shall be furnished in 1-gallon metal cans or 5-gallon steel pails (see 6.2). All container shall be resin-lined.

5.1.1 Additional marking. Each container shall contain instructions for use. It shall be supplied by manufacturer.

## 6. NOTES

6.1 Intended use. Surface sealers covered by this specification are intended for use in sealing and treating new or old wood or cork floors and floor covering. When open-grained wood or cork tile is to be sealed, it should be treated previously with wood filler. (see TT-F-336). Sealers should provide a satisfactory foundation for finishing materials such as varnish, liquid, or paste wax. Class 1 sealer is suggested for use on floors and flooring having rapid and high heavy duty absorptive properties, while class 2 sealer may be used on flooring of denser structure.

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

(a) Title, number, and date of this specification.
(b) Class required (see 1.2.1).
(c) Size of container (see 5.1).
(d) Level of packaging and packing required (see 5.1).

6.3 Unit of purchase. Sealer should be purchased by volume, the unit being a U.S. gallon of 231 cubic inches at 15.56 deg. C. (60 deg. F.).

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FEDERAL SPECIFICATION

SEALER, SURFACE, VARNISH TYPE, FLOOR, WOOD AND CORK

This amendment, which forms a part of Federal Specification TT-S-176E, dated July 23, 1974, was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

PAGE 1

Under Federal Specifications:

Change "TT-F-366" to TT-F-336", change "TT-L-563" to "TT-I-563", and change "TT-P-143" to "PPP-P-1892".

Add paragraph 2.2 as follows:

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

American Society for Testing and Materials (ASTM) Standards:

D 1296 - Test for Odor of Volatile Solvents and Diluents.
D 1343 - Test for Viscosity of Cellulose Derivatives by Ball Drop Method.
D 2369 - Test for Volatile Content of Paints.
D 3278 - Test for Flash Point of Liquids by Setaflash Closed Tester.

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

PAGE 2

Table I. At end of table, add under characteristic "Lead, percent nonvolatile", under minimum, "---", and under maximum, "0.06".

PAGE 3

Paragraph 4.3.1 and table II. Delete and substitute:

4.3.1 The sealer shall be tested as indicated in table II and as specified hereinafter.

TABLE II. Index

| Characteristics | Requirements Reference | Applicable Test Methods | | |
|---|---|---|---|---|
| | | Fed. Test Method Std. No. 141 | ASTM Method | Paragraph Reference |
| Viscosity | Table I | ---- | D 1343 | ---- |
| Nonvolatile vehicle | Table I | ---- | D 2369 | ---- |
| Drying time | Table I | 4061 | ---- | ---- |
| Color | Table I | ---- | E 97 | ---- |
| Flash point | Table I | ---- | D 3278 | ---- |

| | | | | |
|---|---|---|---|---|
| Condition in container | 3.3.1 | 3011 | ---- | 4.3.2 |
| Storage stability | 3.3.2 | ---- | ---- | 4.3.3 |
| Dilution stability | 3.3.3 | ---- | ---- | 4.3.4 |
| Working properties | 3.3.4 | ---- | ---- | 4.3.5 |
| Odor | 3.4.5 | ---- | ---- | 4.3.6 |
| Water resistance | 3.4.6 | ---- | ---- | 4.3.7 |
| Lead content | Table I | ---- | ---- | 4.3.9 |

Paragraph 4.3.6, line 1. Delete "Method 4401 of Fed. Test Method Std. No. 141" and substitute "ASTM Method D1296".

Add new paragraphs:

4.3.9 Lead content.

4.3.9.1 Sample preparation. Using a 0.006-inch film applicator and a mechanical applicator plate, duplicate drawdowns for each sample of well-mixed paint shall be made on a standard paint penetration chart and dried for 24 hours. The drawdown shall be at least 10 inches long on the sealed portion of the penetration chart. The drawdown shall be cut into discs of appropriate size to fit the sample holder of a fluorescence X-ray spectrometer.

4.3.9.2 Procedure. Lead content shall be determined using an X-ray fluorescence spectro-meter capable of determining lead content at a minimum level of 0.03 percent by weight of the total nonvolatile. The settings for a wavelength dispersive fluorescence spectrometer shall be as follows:[1]

| Element | Analytical Line | Angle | Crystal | Detection | Collimeter | X-ray tube (MO) |
|---|---|---|---|---|---|---|
| Pb | L | 33.93 | LiF(200) | Flow S.C. | Fine | 60Kv 45Ma |
| Pb (backgrd I) | | 33.00 | LiF(200) | Flow S.C. | Fine | 60Kv 45Ma |
| Pb (backgrd II) | | 35.50 | LiF(200) | Flow S.C. | Fine | 60Kv 45Ma |
| Mo | K | 20.33 | LiF(200) | Flow S.C. | Fine | 60Kv 45Ma |

Pulse height selection shall be used in all measurements and counting time shall be 100 seconds. Place the sample disc in the wavelength dispersive unit. Measure the count rates of lead, lead background, and the Molybdenum Compton scattered background from the X-ray tube.

4.3.9.3 Calculation.

$$R = \frac{I_{[Pb]} - \frac{I_{[Pb]}\ (\text{Background I}) + I_{[Pb]}\ (\text{Background II})}{2}}{I_{[Mo]}}$$

where I equals gross intensity. These results shall be compared to those obtained with a 0.06 percent lead standard made up from the same type of paint sample and evaluated for compliance with table I.

[1] Energy dispersive fluorescence spectrometers shall be set up according to the manufacturer's manual.

Paragraph 5.2, line 2. Delete "TT-P-143" and substitute "PPP-P-1892".