

TT-P-620C

October 11, 1968

SUPERSEDING

Int. Fed. Spec. TT-P-00620B (GSA-FSS)

November 1, 1966 and

Fed. Spec. TT-P-620A

March 19, 1965

FEDERAL SPECIFICATION

PRIMER COATING, CONDITIONER FOR CHALKING EXTERIOR SURFACES

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers a penetrating surface conditioner to give good inter-coat adhesion between a chalked porous substrate and top coat (see 6.1).

1.2 Classification.

1.2.1 Grade and class. The surface conditioner covered by this specification shall be of one grade and class only.

2. APPLICABLE DOCUMENTS

2.1 The following specifications and standards, of the issues in effect on date of invitation for bids, form a part of this specification to the extent specified herein:

Federal Specifications:

SS-L-30 - Lath, Sheathing, and Wall board, Gypsum.

TT-E-529 - Enamel, Alkyd, Semi-Gloss

TT-L-1155 - Linseed Oil, Alkali Refined

TT-P-143 - Paint, Varnish, Lacquer, and Related Materials;
Packaging, Packing, and Marking Of.

TT-P-442 - Pigment, Titanium Dioxide, (For Protective Coatings).

Federal Standards:

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

Fed. Std. No. 595 - Colors

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

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

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3. REQUIREMENTS

3.1 Material. The primer conditioner as received shall consist of pigment and vehicle specified, so combined as to produce a penetrating conditioner, meeting all the requirements of this specification.

3.2 Pigment. The pigment shall consist of titanium dioxide (TT-P-442, type III), suitable extenders, and shading pigments as necessary to produce the desired color as specified in the contract or purchase order (see 6.2).

3.3 Vehicle. The vehicle shall consist of modified phenolic-fish oil alkyd combined with alkali-refined linseed oil together with the necessary amount of thinner, drier, and antiskinning agent.

3.4 Color. When tested as in 4.3.8, the color of the conditioner shall be an approximate match of the standard chip in Fed. Std. 595 or a color agreed upon by purchaser and supplier (see 6.2).

3.5 Quantitative requirements. The conditioner shall meet the quantitative requirements specified in Table I.

TABLE I. Quantitative Requirements

| Characteristics | Requirements | |
|---|--------------|---------|
| | Minimum | Maximum |
| Pigment content, percent by weight of primer coating: | 51 | 53 |
| Titanium dioxide, percent by weight of extracted pigment | 12 | 14 |
| Extender, percent by weight of extracted pigment | 86 | 88 |
| Vehicle, percent by weight of primer coating | 47 | 49 |
| Nonvolatile vehicle, percent by weight of vehicle: | 53 | -- |
| Alkyd, phenolic-fish oil modified, percent by weight of vehicle | 29 | -- |
| Linseed oil, alkali-refined, percent by weight of vehicle | 23.8 | -- |
| Water content, percent by weight of primer coating | -- | 0.5 |
| Coarse particles and skins, percent by weight of pigment | -- | 1.5 |
| Consistency Krebs-Stormer, Shearing rate, 200 r.p.m.: | | |
| Grams | 175 | 250 |
| Equivalent K.U. | 77 | 89 |
| Drying time: | | |
| Set to touch (hours) | -- | 4 |
| Dry hard (hours) | -- | 24 |
| Fineness of grind | 3 | -- |
| Absorption (inch) | 1/4 | 3/4 |
| Weight per gallon (pounds) | 11 1/4 | -- |

3.6 Qualitative requirements.

3.6.1 Condition in container. The conditioner shall show no excessive settling in freshly-opened container, and shall be easily redispersed with a paddle to a smooth homogeneous state when tested as in 4.3.1.

3.6.2 Adhesion over chalky surface. A film of the conditioner when applied over synthetic chalky surface as tested in 4.3.2 shall show no removal when a strip of masking tape is pulled from the dry film.

3.6.3 Flexibility. A dried film of the conditioner shall show no evidence of cracking and flaking when bent over a 1/8 inch mandrel as prepared and tested in 4.3.3.

3.6.4 Brushing property. The conditioner shall brush easily on absorbent as well as non-absorbent surfaces as tested in 4.3.4 and shall not show excessive brush marks, laps, or unevenness of gloss.

3.6.5 Resistance to lifting. The conditioner shall show no evidence of being lifted when a top coat is applied as tested in 4.3.5.

3.6.6 Skinning. The conditioner shall not skin within 48 hours in 3/4 filled container when tested as specified in Table II.

3.6.7 Alkali resistance. A film of the conditioner prepared and tested as described in 4.3.6 shall not show any cracking, softening or loss of adhesion after 1/2 hour of recovery period.

3.6.8 Water resistance. A film of the conditioner prepared and tested as described in 4.3.7 shall show no more than slight dulling, no softening or any other film irregularities.

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 to the prescribed requirements.

4.2 Sampling and inspection shall be in accordance with method 1031 of Fed. Test Method Std. No. 141.

4.3 Test procedures. The test specified in Table II shall be conducted in accordance with Fed. Test Method Std. No. 141 and as hereinafter specified.

4.3.1 Condition in container. Determine the package condition of the primer coating in accordance with method 3011 of Fed. Test Method Std. No. 141 and observe for compliance with 3.6.1.

4.3.2 Adhesion. (Formula for synthetic chalk: Rutile titanium dioxide 100 grams; Water--55 ml; and Tamol--731*--1 ml). Stir the mixture until uniform and smooth. Draw down a 0.0015 inch film of synthetic chalk on a plane plate glass, using a suitable doctor blade. Bake for 1/2 hour at $100^{\circ} \pm 5^{\circ}$ C. Cool to room temperature and draw a 0.003 inch film of the primer-conditioner over the synthetic chalk with a suitable doctor blade. Allow to air dry for 72 hours. Place a masking tape (1-1/2 inch wide and 3 inches long) over the center of the painted portion, using light pressure on a roller to secure the tape. Allow the tape to remain on the surface for 1/2 hour. Gently remove the tape and examine the adhesive side of the tape for compliance with 3.6.2.

4.3.3 Flexibility. Draw down a film conditioner with a 0.002 inch doctor blade (approximately 0.004 inch gap clearance) on steel panel (method 2011). Air dry for 24 hours, bake for 24 hours at $105^{\circ} \pm 2^{\circ}$ F. and bend rapidly over a 1/8 inch mandrel. Examine as specified in method 6221 for compliance with 3.6.3.

4.3.4 Brushing properties. Determine the brushing properties of the well-mixed conditioner in accordance with method 4321 of Fed. Test Method Std. No. 141 on steel panel and gypsum board (SS-L-30) as specified.

4.3.5 Lifting resistance. Brush a coat of primer conditioner, approximately 1 mil wet film thickness, on a clean steel panel (method 2011), allow to dry at room temperature for 24 hours. Brush a thin coat, approximately 1 mil wet film thickness of exterior enamel conforming to TT-E-529. While brushing observe for lifting. Allow the primer to dry at room temperature for 48 hours and then examine for compliance as specified in 3.6.5.

4.3.6 Alkali resistance. Immerse a solvent-clean, dry test tube in a 400 ml breaker containing 4 inches of well-mixed conditioner, for 5 seconds. Withdraw and suspend the tube in the same position as withdrawn and allow to dry at room temperature for 72 hours. Care must be exercised that the adhering material is not rubbed off. Immerse the coated portion of the test tube for 30 minutes in a 250 ml breaker containing 125 ml of 2 percent sodium hydroxide solution maintained at 20° C. Remove the test tube, allow to dry for 1/2 hour and examine the adhering material for compliance with 3.6.7.

4.3.7 Water resistance. Using the same procedure as in 4.3.6 with another test tube, except 48 hours air dry instead of 72 hours; immerse the coated test tube in a 600 ml beaker containing

*Rohm and Haas Company, Philadelphia, Pennsylvania

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3 inches of distilled water. Cover the beaker and allow to remain for 7 days maintaining the temperature at 20° to 32° C. (70° to 90° F.). Remove, allow to dry for 2 hours at room temperature and examine for compliance with 3.6.8.

4.3.8 Color. Brush a coat of material on a clean white Moresst chart (or equal) of about 3 mils wet film thickness and allow to dry at room temperature for 48 hours. Determine the color in accordance with method 4250 of Fed. Test Method Std. No. 141 for compliance with 3.4.

4.3.9 Alkyd resin (phenolic-fish oil modified). A certified statement from the supplier that the requirement for alkyd resin specified in Table I shall be modified phenolic-fish (see Table III).

4.3.10 Linseed oil, alkali-refined. A certified statement from the supplier that the linseed oil supplied is an alkali-refined conforming to TT-L-1155.

4.3.11 Inspection of preparation for delivery. The packaging, packing, and marking shall be examined and tested to determine compliance with section 5 of this specification.

TABLE II.

| Characteristics | Requirement reference | Fed. Test Method Std. No. 141 | Paragraph reference |
|---|-----------------------|-------------------------------|---------------------|
| Condition in container | 3.6.1 | 3011 | 4.3.1 |
| Consistency | Table I | 4281 | ----- |
| Absorption | Table I | 4421 | ----- |
| Coarse particle | Table I | 4091 | ----- |
| Fineness of grind | Table I | 4411 | ----- |
| Adhesion | 3.6.2 | ----- | 4.3.2 |
| Flexibility | 3.6.3 | 6221 | 4.3.3 |
| Brushing property | 3.6.4 | 4321 | 4.3.4 |
| Drying time | Table I | 4061 | ----- |
| Lifting property | 3.6.5 | ----- | 4.3.5 |
| Skinning | 3.6.6 | 3021 | ----- |
| Resistance tests: | | | |
| Alkali | 3.6.7 | ---- | 4.3.6 |
| Water | 3.6.8 | ---- | 4.3.7 |
| Pigment: | Table I | 4021 | ----- |
| Titanium dioxide | Table I | 7081 | ----- |
| Extenders | Table I | * | ----- |
| Vehicle | Table I | 4032 | ----- |
| Nonvolatile vehicle: | Table I | 4052 | ----- |
| Alkyd; phenolic-fish oil modified resin | Table I | ---- | 4.3.9 |
| Linseed oil, alkali-refined | Table I | ---- | 4.3.10 |
| Color | 3.4 | ---- | 4.3.8 |

*Calculation of extender pigments from the total pigments: total pigment minus titanium dioxide (method 7081) equal extender pigments.

5. PREPARATION FOR DELIVERY

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

6. NOTES

6.1 This material is intended primarily for brush application for repainting over old weathered free chalking masonry surfaces. These surfaces generally exist from weathering of cement-type

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paints such as TT-P-21. The entire surface should be vigorously wire-brushed by hand or by use of a power tool. The surface should be dusted to remove all loose particles, and chalk residue. Materials must be flowed on freely to assure effective penetration. This surface conditioner is not intended for a finish coat.

6.2 Ordering data. Purchasers should exercise any desired options offered herein and procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Level of packaging and level of packing required (see 5.1).
- (c) Unit quantity required (see 5.1).
- (d) When delivery of material is required.
- (e) Color, if required in purchase or order (see 3.4).

6.3 Basis of purchase. The primer covered by this specification should be purchased by volume, the unit being 1 U. S. gallon of 231 cubic inches at 15.6 C. (60° F.)

6.4 Manufacturer's guide. The primer coating, conditioner for free chalking exterior surface found to meet the specification is specified in Table III.

TABLE III.

| | lbs/100 gal. |
|--|--------------|
| Nonchalking rutile titanium dioxide | 75 |
| Calcium carbonate | 200 |
| Magnesium silicate | 150 |
| Aluminum silicate | 150 |
| Diatomaceous silica | 25 |
| Alkali refined linseed oil | 129 |
| Marine alkyd (alkyd, phenolic-fish oil modified) ^{1/} | 287 |
| Heavy mineral spirits (TT-T-291a, grade 2) | 28 |
| Aromatic naphtha (TT-N-97b, type III) | 84 |
| 6 percent cobalt naphthenate | 3.5 |
| 5 percent calcium naphthenate | 2.3 |
| 24 percent Lead naphthenate | 6.0 |
| Antiskinning agent | 1.0 |

^{1/} Marine alkyd-menhaden fish oil was found to be more suitable in this formulation.

CUSTODIANS:

Navy - YD

Air Force - 84

CIVIL AGENCY INTEREST:

GSA

HUD

Review activities:

Army - MD, MR

Navy - YD

Air Force - 84, 85

Orders for this publication are to be placed with General Services Administration, acting as an agent for the Superintendent of Documents. See section 2 of this specification to obtain extra copies and other documents referenced herein. Price 5 cents each.