

TT-F-1098D  
September 23, 1974  
SUPERSEDING  
Int. Fed. Spec. TT-F-001098C (COM-NBS)  
December 11, 1972 and  
Fed. Spec. TT-F-1098B  
June 29, 1967

## FEDERAL SPECIFICATION

### FILLER, BLOCK, SOLVENT-THINNED, FOR POROUS SURFACES (CONCRETE BLOCK, CINDER BLOCK, STUCCO, ETC.)

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 ready-mixed, solvent-thinned vinyl toluene-butadiene copolymer resin block filler for interior and exterior use on cinder block, concrete, stucco, etc.

1.2 Classification. Block filler shall be of one type as hereinafter specified.

#### 2. APPLICABLE DOCUMENTS

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

##### Federal Specifications:

- TT-P-19 - Paint, Acrylic, Emulsion, Exterior.
- TT-P-29 - Paint, Latex-Base, Interior, Flat, White and Tints.
- TT-P-30 - Paint, Alkyd, Odorless, Interior, Flat, White and Tints.
- TT-P-55 - Paint, Polyvinyl Acetate Emulsion, Exterior.
- TT-P-97 - Paint, Styrene-Butadiene Solvent Type, White (For Exterior Masonry).
- TT-P-143 - Paint, Varnish, Lacquer, and Related Materials; Packaging, Packing and Marking of.
- PPP-T-60 - Tape: Pressure-Sensitive Adhesive, Waterproof, for Packaging.

##### Federal Standards.

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

Fed. Std. No. 595 - Colors.

(Activities outside tile Federal Government may obtain copies of Federal Specifications, Standard, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and 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 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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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) Standard:

D 3335 - Determination of Low Concentration of Lead in Paint by Atomic Absorption Spectroscopy.

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

(Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

### 3. REQUIREMENTS

3.1 Material. Material shall be as specified herein. Materials not definitely specified shall be of good commercial quality entirely suitable for the purpose intended. The filler shall be free from material which will be toxic to personnel under normal conditions of use. The filler shall not contain lead compounds in excess of one half of one percent by weight of total nonvolatile, calculated as lead metal. The filler shall not have added any mercury compounds and its mercury metal content shall not exceed a trace quantity. The solvents or solvent system used in the process shall comply with Air Pollution Regulations "Rule 66" [1]. A certificate of compliance to this effect is necessary.

#### 3.2 Composition.

3.2.1 Pigments. The pigment portion shall be a mixture of suitable fillers and extender pigment such as silicas, silicates and calcium carbonate pigments. No asbestos or asbestos shorts shall be present [2]. A suggested starting point formulation is shown in table III.

3.2.2 Vehicle. The vehicle shall be vinyl toluene-butadiene copolymer resin together with solvents, thinner, plasticizer, dispersing agents, wetting agents, etc., as necessary to meet the requirements of this specification.

#### 3.3 Quantitative requirements.

3.3.1 The quantitative requirements of the filler shall be as specified in table I.

TABLE I. Quantitative requirements

Characteristics	Requirements	
	Min.	Max.
Pigment (percent by weight of filler)	57	60
Vehicle (percent by weight of filler)	40	43
Nonvolatile vehicle (percent by weight of vehicle)	22	--
Consistency, Krebs-Stormer, shearing rate, 200 rpm		
Grams	600	--
Equivalent K.U.	120	--
Drying time		
Set to touch (hour)	1/4	3/4

Dry hard (hour)	---	2
Weight per gallon (pounds)	11	--
Vinyl toluene-butadiene copolymer content (percent by weight of nonvolatile vehicle)	58	--
Lead content, (percent by weight of total nonvolatile)	---	0.5

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[1] Information on Rule 60 may be obtained from Air Pollution Control District, of Los Angeles, Los Angeles, CA 90001.

[2] A certificate of compliance to this effect is necessary.

### 3.4 Qualitative requirements.

3.4.1 Condition in container. The freshly opened full container was tested as in 4.3.1, shall be free from lumps, abnormal thickening or livering and shall show no hard setting or caking that cannot be readily reincorporated to a smooth homogeneous state.

3.4.2 Dilution stability. When tested as in 4.3.2, the filler shall remain stable and uniform showing no precipitation, curdling, or separation. Slight pigment settling is permitted.

3.4.3 Brushing properties. The filler, tested as in 4.3.3, shall brush easily, shall not sag, and shall dry to a uniform finish.

3.4.4 Spraying properties. The filler, tested as in 4.3.4, shall spray satisfactorily in all respects, and shall show no running, streaking, or pronounced orange peel. The dried film shall show no seeding, dusting, floating, or other film defects.

3.4.5 Adhesion. The film of the filler, tested as in 4.3.5, shall not flake or separate from the substrate.

3.4.6 Color. Unless otherwise specified the color shall be a commercial white or near white. When specified by the procuring agency, the color shall match the referenced chip in Fed. Std. No. 595. Test as described in 4.3.6.

3.4.7 Lifting. When tested as in 4.3.7, the filler shall show no evidence of being lifted by the topcoat during brushing. The dried film of the topcoat shall show no deformation and other film irregularities.

### 3.4.8 Storage stability.

3.4.8.1 Partially full container. The well-mixed filler in 3/4 full container shall show no skinning within 48 hours, when tested as in 4.3.8.1.

3.4.8.2 Full container. The well-mixed filler, tested as in 4.3.8.2, shall show no livering, curdling, hard-dry caking or tough-gummy sediment. The stored filler shall redisperse readily to a homogeneous state. A certificate of compliance may be submitted by the manufacturer in lieu of the six month test requirement.

## 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 specified herein. Except as otherwise specified the supplier may utilize his own facilities or and, commercial laboratory acceptable to 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. Inspection shall be classified as follows:

- (a) Production inspection of the filler.
- (b) Inspection of preparation for delivery.

4.3 Test procedures. The filler shall be tested in accordance with the following applicable methods of Fed. Test Method Std. No. 141, as indicated in table II and as herein specified. Failure to pass any test and

noncompliance to the requirements shall be cause for rejection of the lot.

TABLE II. Index

Characteristics	Requirement reference	Applicable Tests	
		Fed. Test Method Std. No. 141	Paragraph reference
Condition in container	3.4.1	3011	4.3.1
Consistency	Table I	4281	-----
Dilution on stability	3.4.2	4203	4.2.2
Brushing properties	3.4.3	2051	4.3.3
Drying time	Table I	4061	-----
Color	3.4.6	4250	4.3.6
Adhesion	3.4.5	----	3.4.5

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TABLE II. Index (cont'd)

Characteristics	Requirement reference	Applicable Tests	
		Fed. Test Method Std. No.141	Paragraph reference
Lifting	3.4.7	----	4.3.7
Spraying properties	3.4.4	4331	4.3.4
Storage stability	3.4.8	3021 and 2022	4.3.8
Weight per gallon	Table I	4184	-----
Pigment content	Table I	----	4.3.10
Vehicle	Table I	----	4.3.10
Nonvolatile vehicle content	Table T	4053	-----
Copolymer resin content	Table I	----	4.3.10
Identification of resin	Figure I and 2	----	4.3.9
Lead content	Table I	----	4.3.11

4.3.1 Condition in container. Determine package condition on acceptance testing in accordance with method 3011 of Fed. Test Method Std. No. 141 and observe for compliance as specified in 3.4.1.

4.3.2 Dilution stability. Pour 80 ml. of filler into a 100 ml. graduate and gradually add, with stirring, mineral spirits thinner meeting the requirements of Rule 66 with a 36 Kauri-Butanol value. Continue adding and stirring until the 100 ml. graduation is reached. Then test according to method 4203 of Fed. Test Method Std. No. 141 and observe for compliance as specified in 3.4.2.

4.3.3 Brushing properties. Apply the filler as packaged on a concrete panel, prepared in accordance with method 2051 of Fed. Test Method Std. No. 141, using 2-1/2 inch brush at spreading rate of about 50 square feet per gallon. Observe for brushing properties and sagging, in accordance with method 4321 of Fed. Test Method Std. No. 141 for compliance as specified in 3.4.3.

4.3.4 Spraying properties. Reduce the filler in accordance with manufacturer's instructions. Spray on concrete panel prepared in accordance with method 2051 of Fed. Test Method Std. No. 141 at a spreading rate of about 50 square feet per gallon. Observe for spraying properties in accordance with method 4331 of Fed. Test Method Std. No. 141 for compliance with 3.4.4.

4.3.5 Adhesion (tape test). The coated panel prepared in 4.3.4 shall be used in this test after 48 hours drying. Cut (using stylus) two parallel scratches, one inch apart and penetrating to the substrate on the coated panel. A 1-inch wide strip of masking tape conforming to PPP-T-60 shall be applied across each set of scratches, adhesive side down. The tape shall be pressed down with two passes of a 4-1/2 pound rubber-covered roller approximately 3-1/2 inches diameter by 1-3/4 inches width. The surface of the roller shall have a Durometer hardness value of 70 to 80 range. Remove the tape in one abrupt motion and examine for compliance with 3.4.5.

4.3.6 Color. Brush the filler on a white carrara glass panel at a spreading rate of about 75 square feet per gallon and allow to dry at room temperature for 24 hours. Examine the color for compliance with 3.4.6. When a particular color is specified, make the comparison in accordance with method 4250 of Fed. Test Method Std. No. 141.

4.3.7 Lifting test. Brush a coat of filler at a spreading rate of about 50 square feet per gallon on four concrete panels prepared in accordance with

method 2051 of Fed. Test Method Std. No. 141. Allow the panels to dry at room temperature for 24 hours. Brush a topcoat at spreading rate of approximately 300 square feet per gallon of each of the following paints on the four panels: TT-P-19 or TT-P-55, TT-P-97, TT-P-29 and TT-P-30. While brushing, observe for lifting of filler for compliance with 3.4.7. Allow the topcoats to dry for 24 hours and examine for compliance with 3.4.7.

#### 4.3.8 Storage stability.

4.3.8.1 Partially full container. Determine skinning after 48 hours in accordance with method 3021 of Fed. Test Method Std. No. 141 except use a 3/4 filled 1/2 pint, multiple friction top can. Reseal and store for seven days at 140 deg. F and observe for compliance with 3.4.8.1.

4.3.8.2 Full container. In accordance with method 3022 of Fed. Test Method Std. No. 141, allow a full standard quart can (if the filler to stand undisturbed for six months and then examine the content. Evaluate pigment settling or caking but agitate the can for 5 minutes on the paint shaker prior to re-examination. Make other applicable tests for compliance with 3.4.8.2.



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4.3.9 Identification of resin from vehicle[1]. Apply a few drops of the benzene extract of tile filler to a sodium chloride disc and dry at 60 deg. C for 30 minutes. When the film is of adequate thickness as seen by a trial infrared spectrum, dry disc a vacuum oven one hour at 60 deg. C. Obtain an infrared spectrum by the usual procedure. Compare spectrum with that of know commercial vinyl toluene-butadiene paint resin or refer to Figure 1. There should be a close resemblance.

#### 4.3.10 Determination of resin and pigment.

##### Apparatus

Soxhlet extraction apparatus-500 ml. erlenmeyer flask-24/40 neck.  
Hot plates equipped with magnetic stirrer.  
250-ml. round bottom centrifuge tubes with lips.  
Tube holder for weighing 250-ml. centrifuge tube.  
International Centrifuge, Size 2, Model V, Head No. 277.  
Vacuum oven.  
Drying oven.  
Steam bath

Determination of Chlorinated, Paraffin and Additives (n-Pentane Extractables). Weigh, by difference to the nearest mg. 20 to 25g of well-mixed sample, using a weighing bottle and add to 100g of sodium chloride C.P. or 15g of Celite 110 in 500 ml. glazed porcelain casserole. Mix well and evaporate most of the solvent by heating the casserole on top of the steam bath (not directly over an opening) for 1-1/2 hours. Stir mixture occasionally during evaporation. Dry the casserole in a regular oven at 60 deg. - 70 deg. C overnight. There should be no odor of solvent. If using Celite, open oven door carefully. This material, being light and fluffy, has a tendency to scatter. Crush the lumps in a mortar, taking small portions at a time. Transfer to a Soxhlet thimble (43 x 123 mm) and cover with a plug of glass wool. Extract with 400 ml of n-pentane under vigorous reflux for two hours using a Soxhlet extraction apparatus equipped with a calcium chloride tube. Use five Berl saddles as boiling stones in the 500-ml erlenmeyer flask. Remove the extraction thimble and rinse well with n-pentane. Rinse the Soxhlet with n-pentane and return the rinsings to the 500-ml flask. Evaporate the n-pentane extract to a volume of 75 ml, using a hot plate equipped with a magnetic stirrer and maintaining it at a low heat. This requires constant watching! Separate the small amount of resin present from the other materials by cooling the n-pentane extract in an ice and salt bath for one hour, moving the flask around in the bath frequently. The resin will separate out on the bottom of the flask as a white solid. Also cool a plastic wash bottle containing n-pentane in an ice and salt bath. At the end of the cooling period, decant the supernatant into a tared 250-ml beaker containing three Berl saddles, making certain that none of the saddles from the flask drop into the beaker. Rinse the flask four times with the cold n-pentane, swirling in the ice bath after each rinsing. Transfer the rinsings to the tared beaker. Evaporate the n-pentane extract (supernatant plus rinsings) on a cooler portion of the steam bath. When the n-pentane has been evaporated, leave the beaker directly over the opening at full steam to remove any traces of solvent. Dry in a vacuum oven to constant weight at 60 deg. - 70 deg. C. This requires overnight (16 hour drying).

Net Wt. of n-pentane extract x 100

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Weight of sample = Percent total benzene extractables

Percent total benzene extractables - percent n-pentane extractables  
= Percent toluene-butadiene resin

Determination of Pigment. Dry the 250 ml. centrifuge tubes from the total benzene extractables in an oven at 100 deg. - 105 deg. C to constant weight. This requires overnight (16 hours drying).

Net Wt. of pigment x 100

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Weight of sample = Percent pigment

NOTES (n-Pentane Extractables)

1. The filler-salt or filler-Celite 110 mixture is evaporated on top of the steam bath to prevent any decomposition of the resins. It was found that white paints containing some resins became gray when placed in a casserole directly over the steam opening, owing to decomposition. If, on the other hand, the same paint was evaporated on top of the steam bath, it remained white. Temperature measurements showed 73 deg. C on top and 100 deg. C below the steam bath opening.

[1] Isolated vehicle see 4.3.10.

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2. The purpose of evaporation is to eliminate the original solvents. These must be eliminated in order to reduce as much as possible the solubility of the vinyl toluene-butadiene resin in the n-pentane. The process of concentrating the n-pentane extract and cooling it in an ice and salt bath is to precipitate the small amount of resin present. The supernatant, therefore, contains only the plasticizer (chlorinated paraffin 40) and the dispersing agent.

#### 4.3.11 Quantitative determination of lead.

##### 4.3.11.1 Determine the concentration of lead in accordance with ASTM D 3335.

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

### 5. PREPARATION FOR DELIVERY

5.1 Packaging, packing, and marking. The filler 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 filler shall be in 1-gallon metal can, 5-gallon steel pails, or in 55-gallon steel drums as specified (see 6.2).

### 6. NOTES

6.1 Intended use. The vinyl toluene-butadiene block filler covered by this specification is intended for either interior or exterior use on porous masonry surfaces which have been properly prepared. Proper surface preparation of previously painted surfaces is obtained by removing all loose powdery flaking material by wire brushing, sandblasting, or scraping. On new construction, dirt, loose particles and flaking materials may be removed by wire brushing or scraping. It is intended that the filler-treated surface be painted with a suitable topcoat.

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) Administrative provisions for inspection records (see 4.1).
- (c) Level of packaging and packing required (see 5.1).
- (d) Size of unit container (see 5.1).
- (e) Color required (see 3.4.6) .

6.3 Basis of purchase. The filler should be purchased by volume, the unit being a gallon of 231 cubic inches at 15.6 deg. C (60 deg. F).

6.4 The filler covered by this specification is suitable for brushing and rolling application at package consistency. For spray application, instruction from the manufacturer is necessary.

6.5 Manufacturer's guide. The formulations given in table III have been found to meet this specification and may serve as a guide. However, conformance to formulation does not preclude necessity of complying with applicable requirements of specification.

TABLE III. (Formulation and process of manufacture)

Charge into high speed mixer:

Pounds per 100 gallons

Mineral spirits (Rule 66)	330
*Thixatrol St (variable)	10
Chlorinated paraffin 40	35
Vinyl toluene-butadiene copolymer resin	65

Add and grind:

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Calcium carbonate	200
Super white silica	400
Diatomaceous silica	75

Stir in:

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Mineral spirits (Rule 66)	40
TOTAL	1155

\*Must read 135 - 140 deg. F. Also, reducing solvent should not be added until the filler has reached this temperature.

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July 13, 1993

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FILLER, BLOCK, SOLVENT-THINNED, FOR POROUS SURFACES

(CONCRETE BLOCK, CINDER BLOCK, STUCCO, ETC.)

This notice is approved by the Commissioner, Federal Supply Service, General Services Administration.

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