TT-P-37D
REINSTATEMENT
May 30, 1980
SUPERSEDING
CANCELLATION NOTICE
June 11, 1979

FEDERAL SPECIFICATION

# PAINT, ALKYD RESIN, EXTERIOR TRIM, DEEP COLORS

This notice was issued by the General Services Administration, Federal Supply Service, Washington, D. C. 20406.

This notice is issued to reinstate Federal Specification TT-P-37C dated November 27, 1968, and Amendment-4 dated June 23, 1977. The cancellation notice dated June 11, 1979, on Federal Specification TT-P-37D is hereby canceled.

FSC 8010

TT-P-37C
November 27, 1968
SUPERSEDING
Int. Fed. Spec. TT-P-0037B(HUD-HAA)
August 16, 1967

# FEDERAL SPECIFICATION

## PAINT, ALKYD RESIN, EXTERIOR TRIM, DEEP COLORS

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

## 1. SCOPE

1.1 Scope. This specification covers alkyd resin ready-mixed paint in deep colors for use on primed wood trim, doors, shutters, and primed metal trim or doors.

## 2. APPLICABLE DOCUMENTS

2.1 The following specifications and standards, 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-143 - Paint, Varnish, Lacquer, and Related Materials; Packaging, Packing, and Marking of.
TT-P-442 - Pigment, Titanium Dioxide (For Protective Coatings).
TT-R-266 - Resin, Alkyd; Solutions.
TT-T-291 - Thinner; Paint, Volatile Mineral Spirits (Petroleum-Spirits).

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.

(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 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, D.C. 20402.)

(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., Ft. 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.)

## 3. REQUIREMENTS

3.1 Material. The paint as received shall consist of pigment or pigments and vehicle specified, so combined as to produce a paint meeting all the

requirements of this specification.

3.2 Color. The color of the paint when tested as in 4.3.12 shall match the standard color chip in Fed. Std. No. 595.

3.3 Composition.

3.3.1 Pigments. The pigments listed in Table II, or any combination thereof, shall make up the basic pigmentation for the color specified. Prime pigments shall be of a good commercial quality. Tinting pigments may be used when necessary to match the color chips provided these additional pigments have good color permanence. The titanium dioxide shall be rutile, chalk-resisting type conforming to type III or type IV of TT-P-442. Extender pigments may be used at the discretion of the manufacturer provided the paint conforms to all requirements.

3.3.2 Vehicle. The vehicle shall be alkyd resin conforming to type I, either Class A, B, or C of TT-R-266, together with necessary thinners and driers. Small amounts of antiskinning agents, wetting agents, suspension agents, and anti absorption agents may be added at the discretion of the manufacturer. Solvents or solvent system used shall comply Rule 66 [1].

3.4 Qualitative requirements.

3.4.1 Condition in container. A freshly opened full container of the paint tested as in 4.3.3 shall show no skinning, thickening, livering, gelatinous masses, ingredient separation, and hard caking. The paint shall mix readily to a smooth homogeneous state.

3.4.2 Skinning. A three-quarter filled, closed 8-ounce glass jar of the paint shall show no skinning within 48 hours when tested as specified in 4.3.4.

3.4.3 Brushing properties. The paint shall have satisfactory brushing properties when tested as in 4.3.5 and shall dry to a smooth uniform film free from seeds, runs, sags, or streaks.

3.4.4 Spraying properties. The paint, tested as in 4.3.6, shall spray satisfactorily in all respects and shall show no running, sagging, or streaking. The dried film shall be smooth and uniform.

3.4.5 Dilution (Reducibility) stability. When thinned as in 4.3.7, the paint shall remain stable and uniform showing no precipitation, curdling, or separation. Slight pigment settling shall not be caused for rejection.

3.4.6 Flexibility. A film of the paint prepared and tested as in 4.3.8 shall withstand bending without cracking or flaking.

3.4.7 Knife test. A film of the paint prepared and tested as in 4.3.8 shall adhere tightly to and not flake or crack from the metal. the film shall ribbon or curl from the metal on cutting and the cut shall show beveled edges.

3.4.8 Recoating. When tested as in 4.3.10 recoating of a dried film shall produce no film irregularities.

3.4.9 Accelerated weathering. A film of paint prepared and tested as in 4.3.11 shall show no chalking, a loss or not more than 30 percent of the original 60 degree gloss.

3.5 Quantitative requirements.

3.5.1 The quantitative requirements of the paint shall be as specified in tables I and III.

3.5.2 The pigmentation shall be as specified in table II.

Table I. Quantitative requirements.

| Characteristics | Requirement | |
|---|---|---|
| | Minimum | Maximum |
| Course particle, percent by weight of pigment | ---- | 0.5 |
| Drying time: | | |
| Set to touch, hours | 1/2 | 3 |
| Dry hard, hours | ---- | 18 |
| Fineness of grind | 6 | ---- |

| | | |
|---|---|---|
| 60 degree Gloss, specular | 80 | ---- |
| Water, percent by weight of paint | ---- | 0.5 |

[1] Information on Rule 66 may be obtained from the Los Angeles Air Pollution Control District, Los Angles, California.

Table II. Pigmentation [1]

| ColorNo. Fed.Std. No. 595 | Color Designation | Prime Pigments |
|---|---|---|
| 10032 | Deep Brown | Red Iron Oxide, Lampblack or Carbon black |
| 10080 | Medium Brown | Yellow Iron Oxide, Red Iron Oxide, Lampblack, Titanium Dioxide |
| 11105 | Bright Red | Toluidine Red or Quinacridone Red |
| 12197 | Vivid Orange | Chrome Yellow, Molybdate Orange, Red Iron Oxide, titanium Dioxide |
| 13432 | Bright Yellow | Chrome Yellow, Dinitraniline Orange, Red Iron Oxide |
| 13538 | Orange Yellow | Chrome Yellow, Dinitraniline Orange, Burnt Umber |
| 14036 | Deep Green | Chrome Green, Iron Blue, Lampblack, Titanium Dioxide |
| 14062 | Medium Green | Chrome Oxide Green, Chrome Green, Phthalo Blue |
| 14077 | Green | Titanium Dioxide, Lampblack, Chrome Yellow, Chrome Oxide Green, Phthalo Blue, Zinc Oxide, Red Iron Oxide |
| 14187 | Bright Green | Chrome Yellow, Titanium Dioxide, Lampblack |
| 15042 | Deep Blue | Iron Blue, Titanium Dioxide, Lampblack |
| 15080 | Medium Blue | Iron Blue, Titanium Dioxide, Phthalo Green, Lampblack |
| 15102 | Bright Blue | Titanium Dioxide, Phthalo Blue, Iron Blue, Alizarine Maroon |
| 16314 | Gary | Titanium Dioxide, Zinc Oxide, Lampblack, Yellow Iron Oxide |
| 17038 | Gloss Black | Carbon black |

[1] Extender pigments may be used at the discretion of the manufacturer.

Table III. Specific requirements

| Color No. Fed. Std. No. 595 | Total Solids Percent by Weight of paint | Pigment Solids Percent by Weight of paint | Vehicle Solids Percent by Weight of Vehicle | Consistency K U | | Weight per Gallon Pounds | | Contrast Ratio* |
|---|---|---|---|---|---|---|---|---|
| | Minimum | Minimum | Minimum | Min. | Max. | Min. | Max. | Minimum |
| 10032 | 68 | 23 | 58 | 72 | 82 | 9.0 | 10.0 | 0.98 |
| 10080 | 68 | 23 | 58 | 72 | 82 | 9.0 | 10.0 | 0.98 |
| 11105 | 48 | 8 | 43 | 65 | 72 | 7.5 | 8.5 | 0.80 |
| 12197 | 55 | 17 | 45 | 65 | 72 | 8.5 | 9.5 | 0.93 |
| 13432 | 65 | 35 | 45 | 67 | 82 | 10.5 | 11.5 | 0.95 |
| 13538 | 65 | 35 | 45 | 67 | 82 | 10.5 | 11.5 | 0.95 |
| 14036 | 68 | 17 | 60 | 72 | 82 | 8.5 | 9.5 | 0.98 |
| 14062 | 68 | 18 | 60 | 72 | 82 | 9.0 | 10.0 | 0.98 |
| 14077 | 65 | 37 | 44 | 72 | 82 | 10.5 | 11.5 | 0.98 |
| 14187 | 57 | 31 | 45 | 67 | 82 | 9.0 | 10.5 | 0.98 |
| 15042 | 65 | 14 | 59 | 72 | 82 | 8.5 | 9.5 | 0.98 |
| 15080 | 68 | 17 | 60 | 72 | 82 | 8.5 | 9.5 | 0.98 |
| 15102 | 51 | 9 | 45 | 67 | 82 | 7.5 | 8.5 | 0.98 |
| 16473 | 68 | 38 | 45 | 72 | 82 | 10.5 | 11.5 | 0.98 |
| 17038 | 60 | 8 | 55 | 72 | 82 | 8.0 | 9.0 | 0.98 |

* Contract ratio shall be determined on a draw down film of approximately 1 mil dry film thickness.

## 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 in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the specification 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. Sampling and inspection shall be performed in accordance with method 1031 of Fed. Test Method Std. No. 141.

4.3 Test procedures.

4.3.1 Test conditions. The routine and referee testing conditions shall be in accordance with section 7 of Fed. Test Method Std. No. 141, except as otherwise specified herein.

4.3.2 Tests. The tests shall be conducted in accordance with Fed. Test Method Std. No. 141, except as otherwise indicated in Table IV.

4.3.3 Condition in container. Determine package condition on acceptance testing in accordance with method 3011 of Fed. Test Method Std. 141 and observe for compliance with 3.4.1. Reseal and agitate the can for 3 minutes on a paint shaker. [1] On reexamination of the contents, the disclosure of any gel bodies or undispersed pigment indicated unsatisfactory settling properties.

4.3.4 Skinning. Determine skinning after 48 hours in accordance with method 3021 of Fed. Test Method Std. 141 and observe for compliance with 3.4.2.

4.3.5 Brushing properties. Determine brushing properties in accordance with method 4321 of Fed. Test Method Std. 141 for compliance with 3.4.3.

4.3.6 Spraying properties. Spray the paint as packages or thinned with not more than 5 percent by volume of thinner conforming to TT-T-291, Grade 1, on a steel panel to a dry film thickness between 0.0008 and 0.0010 inch and observe for spraying properties in accordance with method 4331 of Fed. Test Method Std. 141. Determine compliance with 3.4.4.

4.3.7 Dilution (Reducibility) stability. (Determine the dilution stability in accordance with method 4203 of Fed. Test Method Std. No. 141 using 8 parts by volume of paint with 1 part by volume with mineral spirits conforming with TT-T-291 Grade 1. Observe for compliance with 3.4.5. Slight pigment settling shall not cause for rejection.

4.3.8 Flexibility. Determine flexibility as in method 6221 of Fed. Test Method Std. No. 141. Using a film applicator that will deposit a dry film thickness of approximately 1 mil, draw down a 2-inch wide film of paint on tin panel prepared in accordance with method 2012 of Fed. Test Method Std. No. 141. Air-dry for 18 hours then bake 2 hours at 105 +/- 2 degrees C (221 degrees +/- 4 degrees F). Condition the panel for 1/2 hour under referee conditions. Bend over a 1/8-inch mandrel and examine for compliance with 3.4.6.

4.3.9 Knife test. Determine Knife test in accordance with method 6304 of Fed. Test Method Std. No. 141 using a flat portion of flexibility panel. Examine for compliance with 3.4.7.

4.3.10 Recoating. Apply the paint in accordance with method 4321 of Fed. Test Method Std. No. 141 on primed wood panels prepared in accordance with method 2031 using three types wood. Air-dry for 24 hours under referee testing conditions. Apply a second coat cross-wise to the first coat and air-dry as before. Examine for compliance with 3.4.8.

4.3.11 Accelerated weathering. Draw down a film of paint on duplicate flat tin panels prepared in accordance with method 2012 of Fed. Test Method Std. No. 141, with a 0./0025-inch film application. Allow the coated panels to air-dry at room temperature for 96 hours. Measure the gloss and directional reflectance and subject the coated panels for 168 hours to accelerated weathering using the twin arc apparatus in accordance with method 6152 of Fed. Test Method St. No. 141. Examine one exposed coating for chalking. Wash the exposed panel under running water with a thoroughly degreaded lamb's wool pad to remove any scum or dirt. Wipe off water with clean cheese cloth and let dry

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[1] An apparatus of this type, powered by a 1/4 hp motor, operates at a rate of 1350 shakes per minute is manufactured by Red Devil Tools, Irvington, NJ.

for 2 hours. Measure the gloss and reflectance of the exposed panel. Compute the percentage loss of gloss and evaluate for compliance with 3.4.9.

4.3.12 Color. Draw down a film of the paint on a white Morest or Leneta chart using .003 inch film applicator and allow to dry at room temperature for 24 hours. Determine the color in accordance with method 4250 of Fed. Test Method Std. No. 141 for compliance with 3.2.

4.3.13 Packaging, packing, and marking. The paint shall be inspected for compliance with packaging, packing, and marking requirements of section 5.

Table IV. Index.

| Characteristics | Requirement Reference | Applicable Test Method | |
|---|---|---|---|
| | | Fed. Test Method Std. No. 141 | Paragraph Reference |
| Condition in container | 3.4.1 | 3011 | 4.3.3 |
| Skinning (Partially full container) | 3.4.2 | 3021 | 4.3.4 |
| Brushing properties | 3.4.3 | 4321 | 4.3.5 |
| Spraying properties | 3.4.4 | 4331 | 4.3.6 |
| Dilution (reducibility) stability | 3.4.5 | 4203 | 4.3.7 |
| Flexibility | 3.4.6 | 6221 | 4.3.8 |
| Knife Test | 3.4.7 | 6304 | 4.3.9 |
| Recoating | 3.4.8 | 4321 | 4.3.10 |
| Accelerated weathering | 3.4.9 | 6152 | 4.3.11 |
| Color | 3.2 | 4250 | 4.3.12 |
| Consistency | Table III | 4281 | --- |
| Coarse particle | Table I | 4091 | --- |
| Drying time | Table I | 4061 | --- |
| Fineness of grind | Table I | 4411 | --- |
| 60 degree gloss, specular | Table I | 6101 | --- |
| Water content | Table I | 4081 | --- |
| Weight per gallon | Table III | 4184 | --- |
| Contrast ratio (Hiding power) | Table III | 4122 | --- |
| Total solids, Pigment solids, and Vehicle solids | Table III | 4021, 4051 | --- |

5. PREPARATION FOR DELIVERY

5.1 Packaging, packing, and marking. The paint shall be packaged, packed, and marked in accordance with Federal Specification TT-P-143. The level of packaging shall be A, B, or C and the level of packing will be A, B, or C as specified (see 6.2). The paint shall be furnished in 1-quart metal cans, 1-gallon metal cans, 5-gallon metal pails, or 55-gallon steel drums as specified (see 6.2).

6. NOTES

6.1 Intended use. This paint is intended for general exterior use on properly primed or previously painted wood and metal surfaces.

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

(a) Title, number, and data of this specification.
(b) Level of packaging and level of packing required (see 5.1).
(c) Unit quantity required (see 5.1).

(d) Colors as listed in Table II.

6.3 Basis of purchase. The paint covered by this specification should be purchased by volume, the unit being U.S. Gallon of 231 cubic inches at 60 degrees F.

CIVIL AGENCY INTEREST

GSA
HUD

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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.

TT-P-37C
AMENDMENT-4
June 23, 1977
SUPERSEDING
Amendment-3
August 16, 1972

FEDERAL SPECIFICATION

# PAINT, ALKYD RESIN, EXTERIOR TRIM, DEEP COLORS

This amendment, which forms a part of Federal Specification TT-P-37C, dated November 27, 1968, was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

PAGE 1

Under Federal Specification:

Change "TT-P-143" to "PPP-P-1892".
Delete "TT-P-442 - Pigment, Titanium Dioxide (For Protection Coatings)".

Add new paragraph:

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 185 - Test for Coarse Particles in Pigments, Pastes and Paints.
D 358 - Specification for Wood to be used as Panels in Weathering of Paints and Varnishes
D 476 - Specification for Titanium Oxide Pigment.
D 562 - Test for Consistency of Paints Using the Stormer Viscosimeter.
D 1210 - Test for Fineness of Dispersion of Pigment-Vehicle System.
D 1475 - Test for Density of Paint, Varnish, Lacquer and Related Products.

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

Paragraph 3.1 Add the following after "Composition".

The paint shall not contain lead compounds in excess of 0.06 percent by weight of total non-volatile, calculated as lead metal.

Paragraph 3.3.1, line 5. Change "TT-P-442" to "ASTM D 476".

PAGE 2

Table I. Add the following at end of table: Under "Characteristics" add "Lead, percent by weight of total non-volatile" and under "Minimum" add "----" and under "Maximum" add "0.06".

PAGE 3

Table II. Under Prime pigments change the following:

Color number 12197, delete "Chrome yellow, Molybdate orange, Red Iron Oxide, Titanium Dioxide" and substitute "Hansa yellow, dinitroaniline orange, red iron oxide, titanium dioxide".

Color number 13432, delete "Chrome yellow, Dinitroaniline Orange, Red Iron Oxide" and substitute "Hansa yellow, dinitroaniline orange, red iron oxide".

Color number 13538, delete "Chrome yellow, Dinitroaniline Orange, Red Iron Oxide" and substitute "Hansa yellow, dinitroaniline orange, burnt umber".

Color number 14036, delete "Chrome green, Iron Blue, Lampblack, Titanium Dioxide" and substitute "Phthalo green, phthalo blue, hansa yellow".

Color number 14062, delete "Chrome Oxide Green, Chrome Green, Phthalo Blue" and substitute "Chromium oxide, phthalo green, phthalo blue".

Color number 14077, delete "Titanium Dioxide, Lampblack, Chrome Yellow, Chrome Oxide Green, Phthalo Blue, Zinc Oxide, Red Iron Oxide" and substitute "Titanium dioxide, lampblack, hansa yellow, chromium oxide, phthalo blue, zinc oxide, red iron oxide".

Below color number 14077, add the following: color number 14187 Green, Phthalo green, Hansa yellow, Raw Umber, Titanium Dioxide.

Color number 14187, delete "Chrome yellow, Titanium Dioxide, Iron Blue" and substitute "Hansa yellow, titanium dioxide, iron blue".

Table III, below Color No. 14077, add the following in columns 1 through respectively:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 24172 | 60 | 16 | 53 | 72 | 82 | 8.0 | 9.0 | 0.98 |



Paragraph 4.3.2. Delete in its entirety and substitute:

4.3.2 Tests. The paint shall be tested as indicated in Table IV and specified hereinafter.

Paragraph 4.3.10, line 2. Delete "Method 2031" and substitute "ASTM Method D 358".



Add new paragraph:

4.3.14 Lead content.

4.3.14.1 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.

4.3.14.2 Procedure. Lead content shall be determined using an X-ray fluorescence spectrometer 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 | Line | Angle | Crystal | Detection | Collimeter | tube (MO) |
|---|---|---|---|---|---|---|
| Pb | L | 33.93 | LiF (200) | Flow S.C. | Fine | 60kV 45mA |
| Pb (background I) | | 33.00 | LiF (200) | Flow S.C. | Fine | 60kV 45mA |
| Pb (background II) | | 35.50 | LiF (200) | Flow S.C. | Fine | 60kV 45mA |
| Mo | K | 20.33 | LiF (200) | Flow S.C. | Fine | 60kV 45mA |

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

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.

4.3.14.3 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 with those obtained by a 0.06 percent lead standard made up from the same type of paint sample and evaluated for compliance with table I.

Table IV. Delete and substitute:

Table IV. Index.

| Characteristics | Requirement Reference | Applicable Test Method | | |
|---|---|---|---|---|
| | | Fed. Test Method Std. No. 141 | ASTM Method | Paragraph Reference |
| Condition in container | 3.4.1 | 3011 | --- | 4.3.3 |
| Skinning (Partially full container) | 3.4.2 | 3021 | --- | 4.3.4 |
| Brushing properties | 3.4.3 | 4321 | --- | 4.3.5 |
| Spraying properties | 3.4.4 | 4331 | --- | 4.3.6 |
| Dilution (reducibility) stability | 3.4.5 | 4203 | --- | 4.3.7 |
| Flexibility | 3.4.6 | 6221 | --- | 4.3.8 |
| Knife Test | 3.4.7 | 6304 | --- | 4.3.9 |
| Recoating | 3.4.8 | 4321 | --- | 4.3.10 |
| Accelerated weathering | 3.4.9 | 6152 | --- | 4.3.11 |
| Color | 3.2 | 4250 | --- | 4.3.12 |
| Consistency | Table III | ---- | D 652 | --- |
| Coarse particle | Table I | ---- | D 185, Sec 6 | --- |
| Drying time | Table I | 4061 | --- | --- |
| Fineness of grind | Table I | ---- | D 1210 | --- |
| 60 degree gloss, specular | Table I | 6101 | --- | --- |
| Water content | Table I | 4081 | --- | --- |
| Weight per gallon | Table III | ---- | D 1475 | --- |
| Contrast ratio (Hiding power) | Table III | 4122 | --- | --- |
| Total solids, Pigment solids, and Vehicle solids | Table III | 4021, 4051 | --- | --- |
| Lead content | Table I | ---- | --- | 4.3.14 |