TT-C-498C
March 10, 1980
SUPERSEDING
Fed. Spec. TT-C-498B
November 20, 1974 and
Fed. Spec. TT-C-1079B
June 7, 1976

FEDERAL SPECIFICATION

COATING COMPOUND, BITUMINOUS, FILLERS, SOLVENT TYPE, ALUMINUM PIGMENTED

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

1. SCOPE

This specification covers an aluminum pigmented asphalt coating for use on new roofs and in the repair and coating of asphalt and metal roofing.

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:

Military Standard:

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

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

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 117	-	Salt Spray (Fog) Testing.
D 95	-	Water in Petroleum Products and Bituminous Materials by Distillation.
D 224	-	Smooth-Surfaced Asphalt Roll Roofing (Organic Felt).
D 562	-	Consistency of Paints Using the Stormer Viscosimeter.
D 609	-	Preparation of Steel Panels for Testing Paint, Varnish, Lacquer and Related Products.
D 962	-	Aluminum Pigments, Powder and Paste, for Paints.
D 3272	-	Vacuum Distillation of Solvents from Solvent Base Paints for Analysis.
E 260	-	General Gas Chromatography Procedures.

National Motor Freight Traffic Association, Inc., Agent:

National Motor Freight Classification.

(Application for copies should be addressed to the American Trucking Associations, Inc., Traffic Department, 1616 P Street, N.W., Washington, DC 20036.)

Uniform Classification Committee, Agent:

Uniform Freight Classification.

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

3. REQUIREMENTS

3.1 Materials. The roof coating shall be based on solvent cutback petroleum asphalts. The roof coating shall be a uniform mixture of petroleum asphalt, aluminum pigment conforming to ASTM D 962, filler, solvent, and additives processed to meet the requirements of this specification.

FSC 8030

3.1.1 Solvent. The solvent, when tested as specified in 4.3.12, shall conform to the following requirements by volume:

(a) The total of solvent with olefinic or cycloolefinic unsaturation shall not exceed 5 percent.
(b) The total of aromatic compounds with eight or more carbon atoms in the molecule, except ethylbenzene, methyl benzoate, and phenyl acetate, shall not exceed 8 percent.
(c) The total of ethylbenzene, toluene, and branched-chair ketones shall not exceed 20 percent.
(d) A solvent which may be classified into more than one of the above groups shall be considered a member of the group having the lowest allowable concentration.
(e) The total of (a), (b), and (c) shall not exceed 20 percent.

3.2 Qualitative requirements.

3.2.1 Condition in container. The material shall be a smooth, homogeneous mixture after stirring and shall be ready for use without heating or thinning. When a gallon of the coating is stored at 16 deg. C for 48 hours, the material shall not settle to the extent that it cannot be redispersed to a homogeneous mixture in 2 minutes, using a spatula.

3.2.2 Application properties. The material shall be capable of uniform application without difficulty by brush, Heavy duty sprayer, or roofer's mop at a rate of approximately 1 gal per 60 ft^{-2} at any temperature from 5 deg. to 60 deg. C.

3.2.3 Behavior at 71 deg. C. Test pieces prepared and exposed as specified in 4.3.3 shall show no blistering and shall not slip or sag more than 6 mm on either roofing felt or metal. The reverse side of the roofing shall not show penetration of the coating on more than 5 percent of the panel.

3.2.4 Behavior at 0 deg. C. Metal test pieces tested as specified in 4.3.4 shall show no cracking of the coating and no separation of metal and coating.

3.2.5 Weather resistance. The roof coating, when applied according to the manufacturer's instructions, shall not show signs of cracking, blistering or peeling, or a loss of greater than 10 percent of the initial reflectivity when tested as in 4.3.5.

3.2.6 Salt-fog resistance. The roof coating, when applied according to the manufacturer's instructions, shall protect a steel panel from pitting or rusting after being exposed to a 5 percent salt fog for 168 hours.

3.3 Quantitative requirements. The coating shall meet the following requirements in table I.

TABLE I. Quantitative requirements

Characteristics	Minimum	Maximum	Paragraph reference
Nonvolatile content, percent by weight of coating	50	---	4.3.7
Moisture content, percent by weight of coating	---	0.2	4.3.8
Consistency, K.U.	100	130	4.3.9
Reflectivity, percent	50	---	4.3.10

Set to touch, hours	---	4	4.3.11

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein.

4.2 Inspection and testing of the end item.

4.2.1 Lot. The roof coating shall be assembled into lots as specified in MIL-STD-105. In MIL-STD-105, the words "essentially the same conditions" shall be interpreted to mean a manufacturer's batch, which is defined as the end product of all raw materials mixed, blended, or processed in a single operation.

4.2.2 Sampling of the end item for testing. For the purposes of sampling, the lot shall be expressed in units of gallons. Samples from lots shall be taken in accordance with MIL-STD-105 using inspection level S-2 and an acceptable quality level (AQL) of 2.5.

4.2.3 Examination for preparation for delivery. An examination shall be made to determine compliance with the requirements of section 5. The sample unit shall be one shipping container fully prepared for delivery. Sampling shall be in accordance with MIL-STD-105. The inspection level shall be S-2 with an AQL of 4.0 expressed in terms of percent defective.

4.3 Test methods. All tests shall be conducted in accordance with the methods specified in table I. Unless otherwise specified, standard testing conditions are 23 deg. +/- 1 deg. C and a relative humidity of 50 +/- 5 percent. All test reports shall contain the individual values utilized in expressing the final result. Each final result shall be compared with the applicable requirement in section 3 to determine compliance with the specification. Failure to pass any test shall be cause for rejection of the sample.

4.3.1 Condition in container. Place the drum on a drum roll for 1 hour before withdrawing a 1-gal sample or shake the 5-gal can for 10 minutes before withdrawing a 1-gal sample. Allow the 1-gal sample to sit undisturbed overnight and then lower a stiff spatula into the sample and observe whether the material is abnormally thick and to what extent settling or caking exists. Attempt to disperse the coating with the spatula and determine compliance to 3.2.1.

4.3.2 Application properties. Brush the coating at a rate of approximately 1 gal per 60 ft^2 on a 0.4-mm thick, smooth-surfaced steel plate at an ambient temperature of 5 deg. C. A convenient size for the test panel is 100 by 150 mm. Prepare three test panels and note whether the coating spreads easily without drawing or pulling. Repeat the test at 60 deg. C and determine compliance with 3.2.2.

4.3.3 Behavior at 71 deg. C. Prepare two 100- by 150-mm pieces of smooth-surfaced asphalt roofing conforming to ASTM D 224, type II. Also prepare duplicate 100- by 150-mm metal panels from 0.4-mm thick smooth-surfaced steel plate, and clean with solvent according to ASTM D 609, method A. Brush on the coating at a rate of approximately 1 gal per 60 ft^2. Embed a thread in each coating, extending across the coating at a distance of not more than 50 mm from the top of the test panels and measure the distance from the top. After exposing these test panels for 60 minutes at an incline of 15 deg. in a well ventilated room at a temperature not below 15 deg. C, but not in the direct rays of the sun, elevate the test panels to an incline equivalent to 1 inch per foot for 5 hours at 71 deg. C. Remove the panels and examine the metal panels for blisters and all panels for slippage by comparing the distance of the thread from the top of the test panel with the distance at the start of the test. Evaluate the coating compound for compliance with the requirement in 3.2.3.

4.3.4 Behavior at 0 deg. C. Cool the coated metal panels from the test in 4.3.2 to room temperature and immerse them in a container of melting ice for 1 hour. Bend quickly over a 25-mm mandrel and examine for compliance with the requirement in 3.2.4.

4.3.5 Weather resistance. Brush the coating on the underside of 1-gal steel can lids at the rate of 60 ft^2/gal and allow to air dry for 24 hours. The lids shall be free from rust, grease, or other surface contamination prior to painting. Prepare three lids for each jest. Place approximately 50 mm of water in a vented and lined gallon can. Place a lid on the can and heat at 38 deg. C for 50 hours. Examine the lids and measure the reflectivity to determine compliance to 3.2.5.

4.3.6 Salt-fog resistance. The roof coating shall be tested for conformance to 3.2.6 using ASTM B 117.

4.3.7 Nonvolatile content. The nonvolatile content of the roof coating shall be determined by baking a 5-g sample of the material in a tared dish at a temperature of 163 deg. C for 3 hours in a convection oven. The dish and its contents shall be cooled and the weight of the contents determined within

1 minute. The heating, cooling, and weighing operations shall be repeated, except that the baking period shall be 1 hour, until the loss in weight between any two successive weighings is equal to or less than 1 percent of the original sample weight. Two determinations shall be made concurrently. If the results obtained in the two determinations differ by more than 1 percent, the determinations shall be repeated. The final results shall comply with the requirements in table I.

4.3.8 Moisture content. Determine the water content using ASTM D 95 for compliance with the requirement in table I.

4.3.9 Consistency. Determine the consistency using ASTM D 562 for compliance with the requirement in table I.

4.3.10 Reflectivity. This procedure yields a numerical value which represents the ratio (in percent) of the light reflected from the test specimen to that incident on it. The instrument used for this determination shall integrate diffuse and specular reflectance by means of a hollow integrating sphere. The instrument shall be calibrated using standardized placques in accordance with manufacturer's instructions. Two test panels shall be prepared as described in 4.3.2 and allowed to air dry for 24 hours. The total reflectance shall be measured, with readings taken from at least three different areas of each panel. Values from the two different panels shall be averaged to provide the reported value. This value shall comply with the requirement in table I.

4.3.11 Drying properties. Brush the coating on grease-free steel panels at a rate of 60 ft^{-2}/gal. Determine the set-to-touch time by touching the surface at least 10 mm from the edge. Lightly touch the test film with a finger tip and immediately place the finger tip against a piece of clear glass. Observe whether any of the coating is transferred to the glass. For test purposes, the pressure of the finger tip against the coating shall not be greater than that required to transfer a spot of the coating from 3 to 5 mm in cross section. The film shall be considered set-to-touch when it still shows a tacky condition but non of it adhers to the finger. The set-to-touch dry time shall comply with the requirement in table I.

4.3.12 Solvent analysis. Analyze the solvent by gas chromatography. The solvent shall be separated from the room coating as specified in ASTM D 3272 and then injected into the gas chromatograph. The procedure specified in ASTM E 260 and any apparatus, operating conditions, columns, and options permitted therein shall be used for the chromatographic analysis. The accuracy of the analysis shall be 0.25 percent absolute by weight or less for each component, and the reproducibility shall be 0.25 percent absolute by weight over three or more runs. All peaks 0.25 percent of the sample or greater shall be identified and quantified. Convent percent by weight to percent by volume, and evaluate the results for compliance with 3.3.1.

5. PREPARATION FOR DELIVERY

5.1 Packing. Packing shall be level A or commercial, as specified (see 6.2).

5.1.1 Level A. The roof coating in quantities of 5, 30, or 55 gal shall be furnished in metal cans and metal drums conforming to item 260 of the National Motor Freight Classification and the Uniform Freight Classification.

5.1.2 Commercial. The roof coating shall be packed in a manner that will insure acceptance by common carrier and provide product protection against loss and damage during multiple shipment, handling, and storage. The shipping container shall be in compliance with the National Motor Freight Classification and rule 40 of the Uniform Freight Classification.

5.2 Marking. Marking shall be as specified in the contract or order.

6. NOTES

6.1 Intended use. This roof coating is intended for use on new roofs and for the repair and coating of asphalt and metal roofing. These coatings are useful in reducing the temperatures in the building beneath the roof because the aluminum reflects radiant energy.

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) Level of packing required (see 5.1).
(c) Size of container required (see 5.1.1).

MILITARY CUSTODIANS:

Army - ME
Navy - YD
Air Force - None

Preparing activity:

GSA - FSS

CIVIL AGENCY COORDINATING ACTIVITIES:

GSA - PCD
NASA - JFK
AGR - AFS

This document is available from the General Services Administration (GSA), acting as an agent for the Superintendent of Document. A copy for bidding and contracting purposes is available from GSA Business Service Centers. Copies are for sale at the General Services Administration, Specification Sales, Building 197 (Washington Navy Yard), Washington, DC 20407.