

TT-C-492C
 May 31, 1974
 SUPERSEDED
 Int. Fed. Spec. TT-C-0492B (SSA-FSS)
 March 2, 1972 and
 Fed. Spec. TT-C-492A
 May 23, 1966

FEDERAL SPECIFICATION

COATING COMPOUND, PAINT ANTISWEAT

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 compound applied by brush or spray to provide antisweat protection on surfaces subject to condensation.

1.2 Classification. The compound shall be of one type and class only.

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:

QQ-S-698 - Steel, Sheet and Strip, Low-Carbon.
 TT-P-143 - Paint, Varnish, Lacquer, and Related Materials; Packaging, Packing and Marking Of.
 TT-P-636 - Primer Coating, Alkyd, Wood and Ferrous Metal.
 TT-T-291 - Thinner; Paint, Volatile Spirits, Petroleum Spirits.

Federal Standards:

Fed. Test Method Std. No. 141 - Paints, Varnish, Lacquer, and 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, 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.)

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:

E 70 - Method of Test for pH of Aqueous Solutions with Glass Electrode.
 D 476 - Titanium Dioxide Pigments.
 E 2088 - Test for Low Concentration Lead.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19102.)

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3. REQUIREMENTS

3.1 The compound as received shall consist of suitable pigment and vehicle, so combined as to produce a compound, meeting all the requirements of this specification.

3.2 Pigments. The pigments shall consist of titanium-dioxide conforming to ASTM D 476, type I and suitable extenders provided the product meets all the requirements.

3.3 Vehicle. The manufacturer is given latitude in the selection of materials providing the finish product conforms to this specification. The volatile solvent used in the process shall be a thinner conforming to TT-T-291 type II, grade A or a solvent system complying with "Rule 66".*

3.4 Quantitative requirements.

3.4.1 The quantitative requirements of the coating compound shall be as specified in table I and as herein specified.

TABLE I. Quantitative Requirements

Characteristics	Requirements	
	Minimum	Maximum
Coverage (sq. ft./gallon) (1/32" wet film)	50	--
Nonvolatile (percent by weight of product)	40	--
Viscosity (Stormer seconds) ^{1/}	60	--
Drying time (hours) hard	--	8
Vehicle (percent by weight of product)	--	60
Flash point (Pensky Martin - °F.)	95	--
pH value	9	--
Weight per gallon	9.6	10.2
Pigment (percent by weight of product)	26	32
Titanium dioxide (percent by weight of extracted pigment)	9	11
Extender or other pigments (percent by weight of pigment)	89	91
Lead (metal), percent by weight of total nonvolatile	--	0.5

^{1/} Stormer viscosimeter - 100 r.p.m.; 1000 grams at 77°F., paddle type mixer.

3.5 Qualitative requirements.

3.5.1 Condition in container. The compound as received shall be well mixed and ready for use. There shall be no caking or thickening to such a degree it cannot be redispersed easily with a paddle when tested as in 4.3.3.

3.5.2 Brushing property. The coating compound shall be capable of being brushed on primed or sealed surfaces as tested in 4.3.4. (Certain amount of pulling is unavoidable with brush application due to the high viscosity and fibrous nature of the material).

3.5.3 Spraying property. The coating compound shall be readily applied by the use of airless spray equipment or pot-type pressure spray equipped with self-cleaning nozzle. (See 4.3.5).

3.5.4 Odor. The odor of the compound during and after application shall not be pungent.

3.5.5 Color. The color shall match the standard agreed upon by the purchaser and the supplier and shall match the color standard specified in Fed. Std. No. 595.

3.5.6 Fire resistant. The coating compound shall not support combustion, shall have an average char of not greater than 6 inches and the combustion plus ignition time shall not exceed 4-1/4 minutes as specified in 4.3.8.

3.5.7 Condensation. There shall be no condensation on the dried coating within 8 hours as tested in 4.3.9.

3.5.8 Toxicity. The coating compound shall not be toxic to personnel under normal condition of use (see 4.3.10).

* Information on Rule 66 should be obtained from Air Pollution Control District, County of Los Angeles, California 90001.

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, the supplier may utilize his own facilities or any 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 Classification of inspection. Inspection shall be classified as follows:

- (a) Production inspection of the coating.
- (b) Inspection of preparation for delivery (see 4.3.15).

4.3 Production inspection.

4.3.1 Sampling and inspection. Sampling and inspection shall be in accordance with Fed. Test Method Std. No. 141, section 1000.

4.3.2 Test procedures. The coating compound shall be tested in accordance with the following applicable methods of Fed. Test Method Std. No. 141 as indicated in table II and as hereinafter specified. Failure to pass any test and noncompliance to the requirements in table I shall be cause for rejection of the lot.

TABLE II. Index

Characteristics	Reference Requirement	TESTS	
		Fed. Test Method Std. No. 141	Paragraph Reference
Condition in container	3.5.1	3011	4.3.3
Brushing property	3.5.2	----	4.3.4
Spraying property	3.5.3	----	4.3.5
Odor	3.5.4	----	4.3.6
Color	3.5.5	----	4.3.7
Fire resistant	3.5.6	----	4.3.8
Condensation	3.5.7	----	4.3.9
Toxicity	3.5.8	----	4.3.10
Coverage	Table I	----	4.3.11
Nonvolatile	Table I	4041	-----
Viscosity	Table I	4281	-----
Drying time	Table I	----	4.3.12
Vehicle	Table I	4051	-----
Flash point	Table I	4293	-----
pH value	Table I	----	4.3.13
Weight per gallon	Table I	4184	-----
Pigment content	Table I	4021	-----
Titanium dioxide	Table I	7081	-----
Lead content	Table I	----	4.3.14

4.3.3 Condition in container. Examine the coating compound as received for compliance as specified in 3.5.1 in accordance with method 3011 of Fed. Test Method Std. No. 141.

4.3.4 Brushing property. Prepare two 6 x 8 inches steel panels (QQ-S-698), clean and prime with primer coating, TT-P-636, at a rate of 450 square feet/gallon. Allow the primer coating to dry at room temperature for 72 hours. Apply the thoroughly mixed coating compound without diluting with a 3- or 4- inch nylon brush (do not use bristle brush) on one of the panels. Observe while brushing for pulling as specified in 3.5.2.

4.3.5 Spraying property. Spray the coating compound on the other primed panel prepared in 4.3.4 using airless spray equipment with appropriate nozzle. Observe the ease of application.

4.3.6 Odor. Observe the odor of the coating compound as applied in 4.3.4.

4.3.7 Color. The brushed film, as applied in 4.3.4, shall match to the standard agreed upon by the purchaser and supplier and shall match color standard in Fed. Std. No. 595.

4.3.8 Fire resistant.

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4.3.8.1 Apparatus. ^{1/} The fire resistance of the compound shall be determined by an apparatus as shown on figures 1, 2, and 3 which consists of communicating horizontal and vertical flues constructed of asbestos board lined steel sheets with the expansion of the horizontal bottom plate which is all steel. The enclosure shall be 36 inches long overall; flue shall be 8 inches wide 6 inches high. The horizontal bottom plate shall be cut away 3 inches at the firing end to provide clearance for the flames of four open blast burners. Details of the test hood and specimen holder are shown on figure 4. Details of the burner supply manifold and open burner nozzle are shown on figure 5. A schematic flow diagram for the apparatus is shown on figure 6. (See 6.4 for parts list.)

4.3.8.2 Procedure. The compound shall be applied to the specimen holder shown on figure 4, by a drawdown method which will produce a dry film thickness of 1/32 inch, onto the steel plate (1/8 inch thick) that have been prepared by removing all rust, mill scale and organic matter and finish off by grinding the surface with No. 24 grit abrasive cloth or paper. The covered steel specimens shall be cured for 96 hours before conducting tests. Unless otherwise specified herein, all curing and testing shall be conducted under atmospheric conditions at a temperature of 70° to 75°F. and a relative humidity of 50 ± 2 percent. The holder (1/8 inch thick mild steel plate 31-1/2 inches long by 7 inches wide with longitudinal flanges for mounting in the horizontal flue) shall be secured in the flue, 2 inches above the bottom plate and with the inner end spaced 3 inches from the flue end, to permit hot gases passing beneath the holder to be vented through the vertical flue. The four open blast burners shall be located side by side and parallel to the front end of the holder, on 1-3/4-inch centers, equidistant from each side of the flue. The center of the burners shall be located 4 inches below the bottom surface of the holder, and shall be 1/2 inch in front of the firing end of the holder. The gas used shall be commercial propane having a heating value of 2,550 B.t.u. per cubic foot at a temperature of 60°F. and atmospheric pressure of 30 inches of mercury. The gas and air shall be supplied to a common manifold at rate of 9.6 and 150 cubic feet per hour, respectively, when referred to standard conditions of 60°F. and 30 inches of mercury. The burner flames shall be applied for four minutes and then immediately removed. A draft of 0.06-0.02-0.00 inch of water shall be maintained in the flue of the apparatus for the duration of the test.

4.3.8.3 Measurement. Ignition plus combustion time and average char shall be noted. These quantities are defined as follows:

- (a) Ignition plus combustion time. The time taken from the initial application of the burner flames until all flaming of the specimen ceases.
- (b) Average char. Length of the specimen permanently damaged by burning and charring as averaged over the entire width of the specimen. This measurement shall be taken after all flaming and glowing ceases.

4.3.9 Condensation. This test shall be conducted using the equipment shown in figure 7. The cylinders, coated with 1/32 inch dry film thickness of the compound, are filled with ice cubes and water and maintained at a temperature between 52° and 32°F. throughout the test period. The interior of the cabinet is maintained at a temperature of (80 ± 2)°F. and a relative humidity of 67 ± 2 percent which is obtained by inserting in the cabinet a tray containing a saturated solution of monoammonium phosphate. Examine the receptacle (graduate) every hour during the test for compliance as specified in 3.5.7.

4.3.10 Toxicity. A supplier's certified statement that the material is not toxic under normal condition of use is necessary.

4.3.11 Coverage. A certified statement from the supplier that the coating compound shall have a coverage of at least 50 square feet per gallon and 1/32 inch dry film thickness is acceptable.

4.3.12 Drying time. Apply a thoroughly stirred coating material to a steel panel (see method 2011 of Fed. Test Method Std. No. 141) using a doctor blade producing 1/16-inch wet film thickness and allow to dry in almost vertical position. Examine for compliance as specified in table I.

4.3.13 pH value. ASTM E 70 may be used for determination of the pH value.

4.3.14 Test for lead content shall be in accordance with ASTM D 2088.

^{1/} Information on the apparatus may be obtained from U.S. Naval Ship Engineering Center, Prince Georges Plaza, Ryattsville, Maryland 20785.

4.3.14.1 Calculation.

Lead (Percent by weight of total non-volatile) = $\frac{A}{B} \times 100$, pt.

Where: A = Grams of lead oxide (PbO₂) in ash.

B = Grams of total nonvolatile of paint or dried paint film.

4.3.15 Inspection of preparation for delivery. The packaging, packing, and marking 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 coating compound furnished in 1 gallon cans or 5 gallon pails 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 level A, B, or C as specified (see 6.2).

6. NOTES

6.1 Intended use. The coating compound is intended for application on surfaces such as concrete, plaster wall, asbestos sheeting, iron, steel, galvanized or zinc coated metal, aluminum, copper and brass tubing, bituminous or cresote coated surfaces that are subjected to intermittent condensation. The material is not intended to be used where condensation is continuous or where there is no chance of recovery period.

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) Size of container required (see 5.1).
- (c) Color required (see 3.5.5).
- (d) Selection of applicable levels of packaging and packing (see 5.1).

6.3 Preparation of surface.

6.3.1 The surface must be free of all dirt, grease, rust, and loose particles.

6.3.2 Correct primer must be used before applying the coating compound as follows:

Primer	Surface to be coated
TT-S-179	Plaster or wallboard
TT-P-641	Galvanized or zinc coated metal
TT-P-636	Ferrous metal
TT-P-664	Iron or steel

The primer must completely cover the surface and the surface must be thoroughly dry before applying the coating material. The coating material must completely dry before applying each succeeding coat if necessary.

6.4 Application.

6.4.1 By brushing. Stir thoroughly before using. Use the compound without diluting; apply with a 3- or 4-inch nylon brush (do not use bristle brush) "lay on" in thick coat; do not try to brush out to a smooth coat; apply additional coats at right angle to direction of brushing previous coat. Allow 8 hours air drying between coats.

6.4.2 By spraying.

6.4.2.1 Using pot-type air pressure spray. Thin the compound to manufacturer's direction. Nozzle pressure should be 40-50 p.s.i. Pressure pot should have a bottom outlet and a large diameter fill hose. Pot pressure should be 15-20 p.s.i. Nozzle should be of the type used for the material of the viscosity of this compound.

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6.4.2.2 Using airless spray. For large areas the use of airless spray is more economical. With special nozzle, it is possible to apply up to 1/8 inch of coating (without diluting) in one application.

6.5 Apparatus. Parts list is given below:

Fire test apparatus parts list				U.S. Naval Applied Science Laboratory
Part	Quantity	Description	Function	Suggested source
A	1	Venturi mixer No. 13-12	Mixing of propane and air	American Gas Furnace, Co., Elizabeth, N. J.
B	1	Zero governor for propane No. 20-1	Reduction of propane Pressure to atmospheric	American Gas Furnace, Co., Elizabeth, N. J.
C	1	Flowmeter, propane Xlt-155-3	Measurement of propane flow	American Gas Furnace, Co., Elizabeth, N. J.
D	1	Flowmeter, air 3x5-100cc	Measurement of air flow	American Gas Furnace, Co., Elizabeth, N. J.
E	4	Nozzles, Stickite ST 2A, alloy steel	Control of igniting and heating flame charac- teristics	Eclipse Fuel Engineering Co., Rockford, Illinois
F	2	Toggle valves No. 455, brass	Gas and air quick shut-off valves	Hoke, Inc., Englewood, N. J.
G	2	Metering valves, straight pattern No. 4RE281	Fine adjustment of propane and air flow	Hoke, Inc., Englewood, N. J.
H	1	Oil burner type draft regulator	Maintenance of constant draft	Any Domestic Oil Burner Supply House
I	1	Nullmatic pressure regulator and pressure gage (0.60 p.s.i.) No. 40-11-50	Regulation of air pressure supply to apparatus	Moore Product Co., Philadelphia, PA
J	3	Windows, vycor glass, ground and polished 10-1.4-by 2-1/4- by 1/8-inch	Viewing of flames	F.S. Gray and Co., Inc., 182 So. Portland Ave., Brooklyn, N. Y.
K	2	Windows, vycor glass, ground and polished 8-by 3-by 1/8 inch	Viewing of flames	F.S. Gray and Co., Inc., 182 So. Portland Ave., Brooklyn, N. Y.
L	1	Inclined draft	Measurement of draft in flue	Ellison Draft Gage Co., 345 W. Monroe St., Chicago, Illinois
M	1	Air line filter	Removal of contaminants from air supply	Commercial

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Preparing activity:

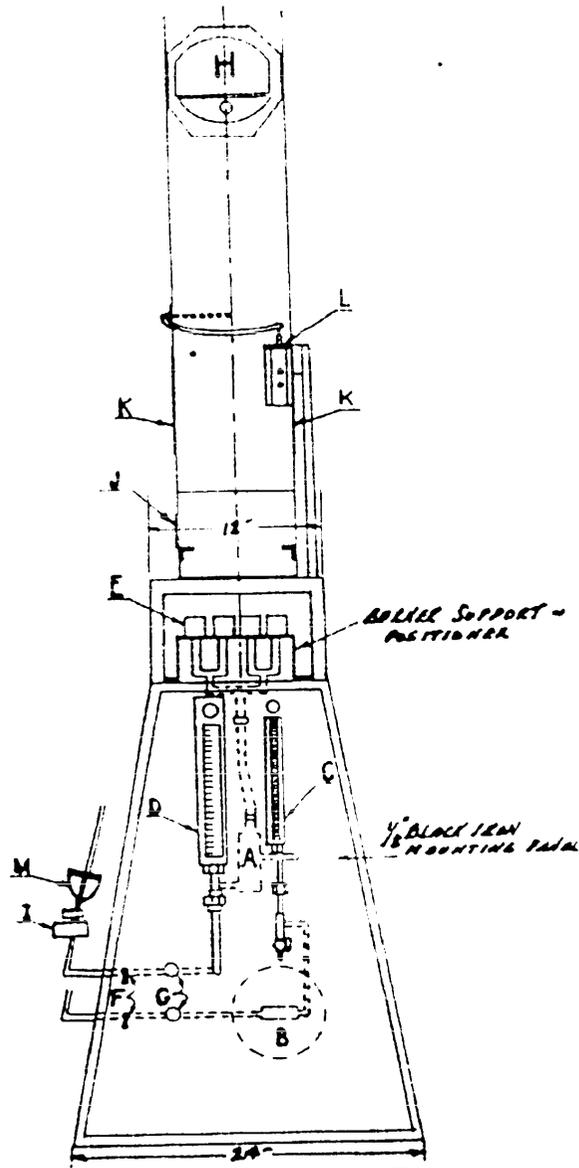
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Review activities:

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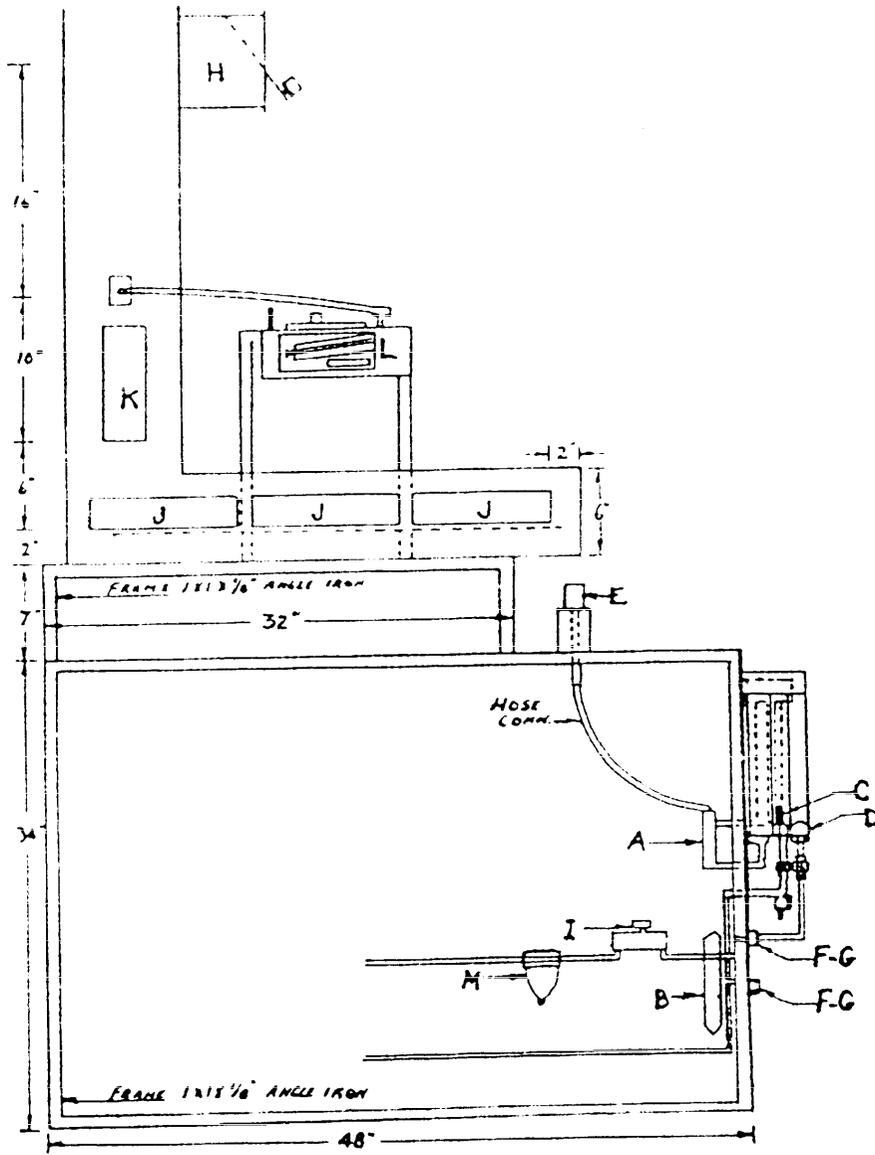
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FIRE TEST APPARATUS FRONT VIEW

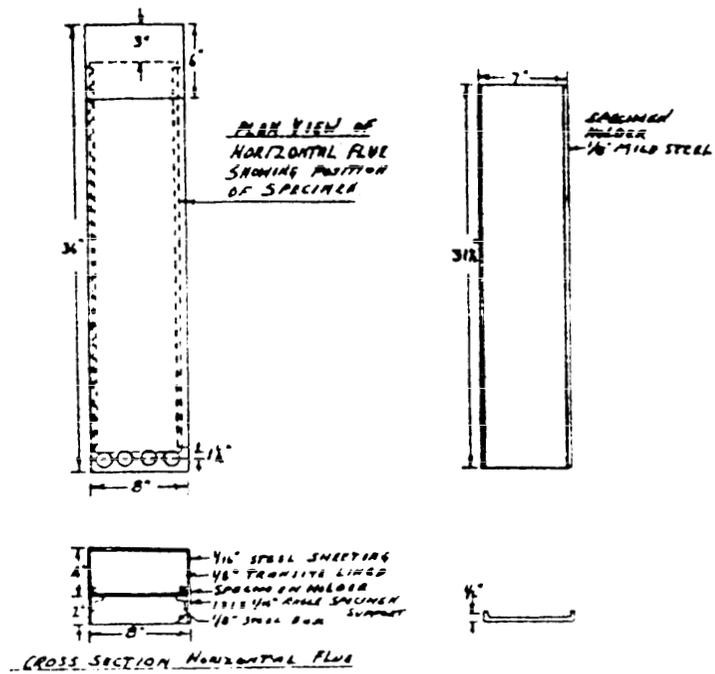
FIGURE 1

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FIRE TEST APPARATUS SIDE VIEW

FIGURE 2



FIRE TEST APPARATUS HORIZONTAL FLUE AND SPECIMEN HOLDER DETAIL

FIGURE 3

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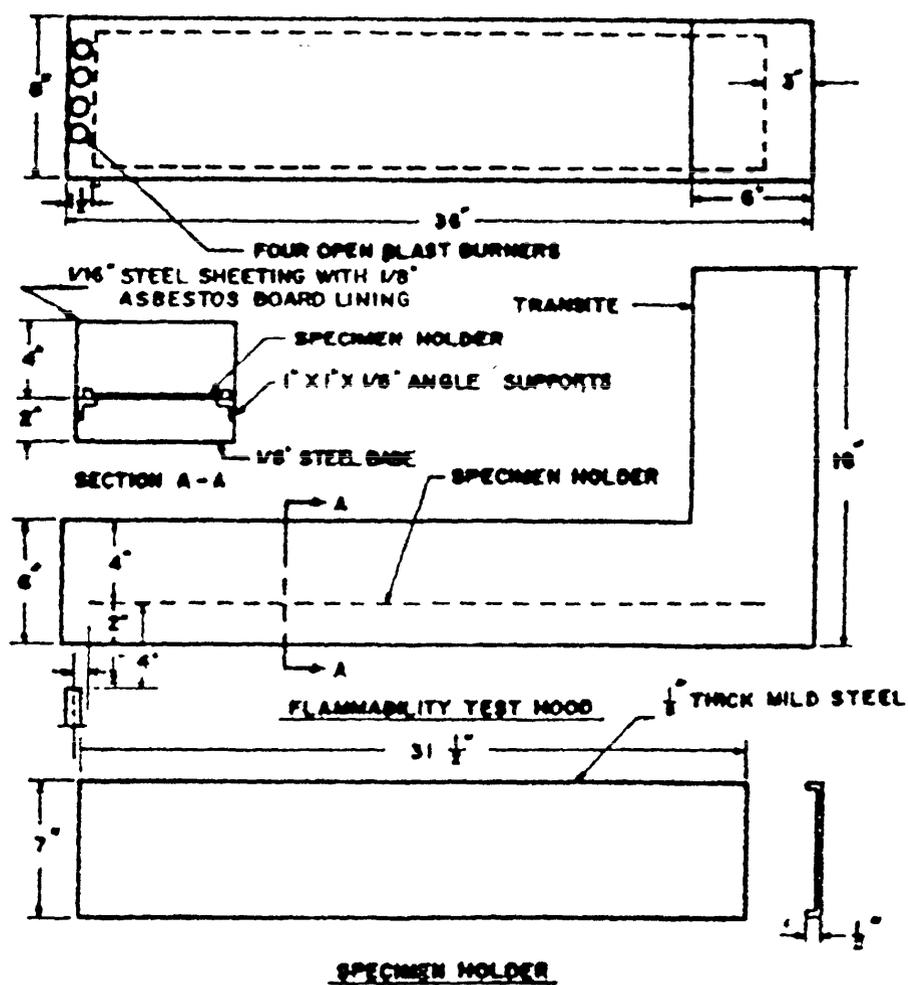


FIGURE 4. Detail of fire-resistance test apparatus

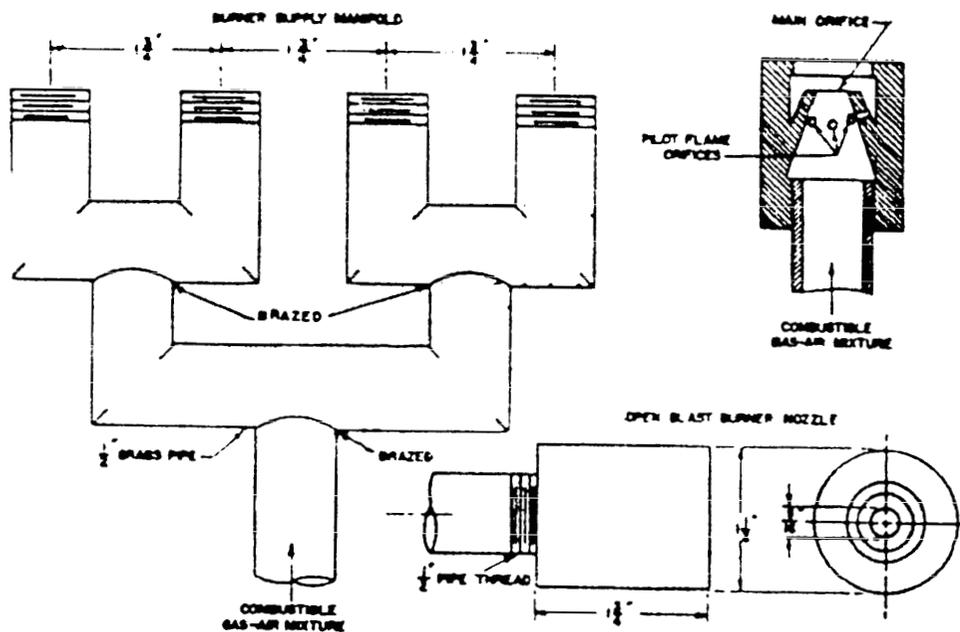


FIGURE 5. Burner supply manifold and open blast burner nozzle

SCHMATIC FLOW DIAGRAM
FOR FIRE TEST APPARATUS

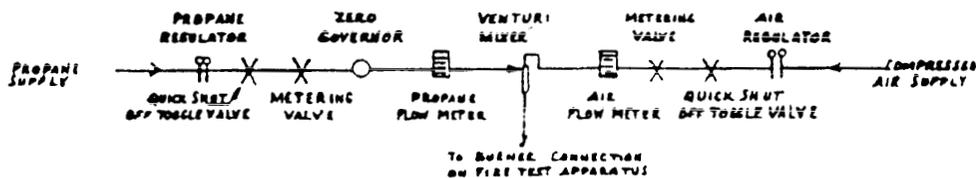
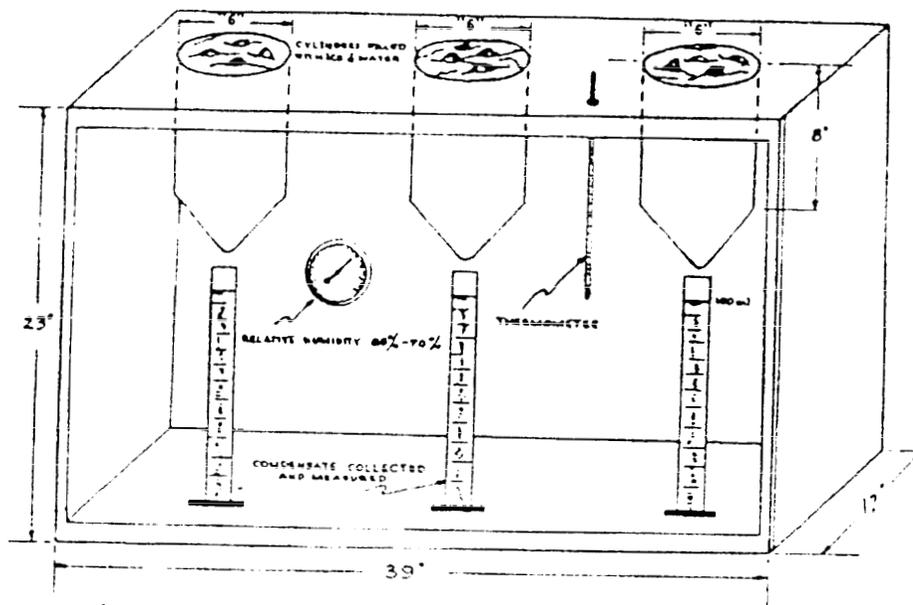


FIGURE 6

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COPPER CYLINDER WALL THICKNESS OF .021 INCH.
 EACH COPPER CYLINDER COATED WITH A FILM THICKNESS OF 1/4 INCH DRY.
 FRONT OF CABINET REVEALS WITH REMOVABLE GLASS PANEL.

FIGURE 7

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 15 cents each.

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<u>INSTRUCTIONS</u>		
This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).		
SPECIFICATION		
ORGANIZATION (of submitter)		CITY AND STATE
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT \$
MATERIAL PROCURED UNDER A		
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1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?		
A. GIVE PARAGRAPH NUMBER AND WORDING.		
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<input type="checkbox"/> YES <input type="checkbox"/> NO IF "YES", IN WHAT WAY?		
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