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MIL-C-81346B(AS)
15 January 1973
SUPERSEDING
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18 December 1967

MILITARY SPECIFICATION

COMPOUND, DECK COVERING, NONSLIP, LIGHTWEIGHT FOR ALUMINUM ALLOY LANDING MATS

This specification has been approved by the Naval Air Systems Command, Department of the Navy.

* 1. SCOPE

1.1 Scope. This specification covers the requirements for nonslip deck covering compounds for aluminum alloy landing mats. The compounds are suitable for use under Air Pollution Regulations.

1.2 Classification. Deck covering compound shall be of the following types as specified (see 6.2):

Type I - 24 hours air-dry or 1 hour bake-dry.
Type II - 6 hours air-dry.

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS

Federal

QQ-A-250/11	Aluminum Alloy 6061, Plate and Sheet
TT-P-143	Paint, Varnish, Lacquer, and Related Materials, Packaging, Packing, and Markings of

Military

MIL-G-5572	Gasoline, Aviation, Grades 80/87, 91/96, 100/130, 115/145
MIL-T-5624	Turbine Fuel, Aviation, Grades JP-4 and JP-5

FSC 8010

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Military (Continued)

MIL-M-7752	Metal Cleaner, Silicate Soap

STANDARDS

Federal

Federal Test Method Standard No. 141	Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling and Testing
FED-STD-601	Rubber, Sampling and Testing

Military

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	Marking for Shipment and Storage

PUBLICATIONS

Naval Air Systems Command

NAEC Test Directive No. CTL 385, Revision I, dated 4 November 1964

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 Qualification. Deck covering compounds furnished under this specification shall be products which are qualified for listing on the applicable Qualified Products List at the time set for opening of bids (see 4.3 and 6.4). Any change in the formulation of a qualified product will necessitate its requalification. The material supplied under the contract shall be identical, within manufacturing tolerances, to the product receiving qualification.

* 3.2 Composition. The compound shall be a composition of synthetic binders and abrasive particles for application on aluminum alloy surfaces prepared as specified (see 5.4).

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3.2.1 Binder. The binder shall consist of two components; Component I shall contain the resin material and abrasive; Component II shall contain the accelerator or curing agent.

3.3 Odor. The odor of the compound, as packaged components or as film after application, shall not be obnoxious.

3.4 Toxicity. The material shall have no adverse effect on the health of personnel when used for its intended purpose. Questions pertinent to this effect shall be referred by the procuring activity to the appropriate department medical service who will act as an advisor to the procuring activity.

3.5 Nonvolatile content. The nonvolatile content of the admixed components shall be not less than 70 percent.

* 3.5.1 Volatile content. The volatile content of the admixed components shall consist of a nonphotochemically reactive solvent. A nonphotochemically reactive solvent is any solvent with an aggregate of less than 20 percent of its total volume composed of the chemical compounds classified below or which does not exceed any of the following individual percentage composition limitations, referred to the total volume of solvent (see 4.7.2.3):

(a) A combination of hydrocarbons, alcohols, aldehydes, esters, ethers, or ketones having an olefinic or cycloolefinic type of unsaturation: 5 percent;

(b) A combination of aromatic compounds with eight or more carbon atoms to the molecule except ethylbenzene: 8 percent;

(c) A combination of ethylbenzene, ketones having branched hydrocarbon structures, trichloroethylene or toluene: 20 percent.

* 3.5.2 Thinner. The thinner to be used shall be nonphotochemically reactive as defined in 3.5.1, and shall be compatible with the system.

3.6 Color. The color of the dried film shall be Marine Corps Green, Shade No. 23 (see 6.3).

* 3.7 Drying time.

3.7.1 Type I. When the compound is applied as specified in 4.7.1, the coating shall air dry through within 24 hours of application. The coating shall dry through within 60 minutes, maximum, when applied and baked in accordance with manufacturer's recommendations. The baked film shall not be discolored. Type I compound shall ready for use after the 24 hour air-dry or 60 minute bake-dry period.

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3.7.2 Type II. When Type II compound is applied as specified in 4.7.1.1, the coating shall air-dry through within 6 hours of application and shall be ready for use for its intended purpose.

* 3.8 Working properties.

3.8.1 Mixing. The resin component, Component I, shall be capable of being easily mixed to a smooth homogeneous condition. Owing to the relatively coarse nature of the abrasive particles, some sediment may develop on standing, but with normal stirring, the settled matter shall reincorporate to form a homogeneous mixture. The accelerator or curing agent, Component II, shall be homogeneous and free from suspended matter (see 4.6.1). After Component I has been sufficiently agitated, Component II shall then be slowly poured into Component I with constant stirring until the entire mixture is homogeneous.

3.8.2 Application. When components I and II of Type I compound are admixed, the compound shall have a minimum application time of 4 hours at 75 ±5°F (see 4.6.1). The minimum application time of Type II compound shall be 2 hours at 75 ±5°F when admixed. When admixed, Type I or Type II compound shall be a freely working product for application by troweling, brushing, rolling, or spraying on aluminum surfaces.

3.8.3 Coverage. One gallon of the deck compound shall cover an area of 60 to 70 square feet with a wet-film thickness of 21 mils minimum, when applied by the spray method as specified in 4.6.1.

3.9 Resistance properties.

3.9.1 Resistance to impact and spinning wheel. When tested as specified in 4.7.3 (Type I) or 4.7.4 (Type II), the compound shall show no more than slight cratering; slight flaking of covering in area of impact and spinning wheel; covering removable with some difficulty with scraper within the area of impact and spinning wheel; but covering hard and tough, difficult to remove in areas between impacts or spinning wheel marks.

3.9.2 Fire resistance. When tested as specified in 4.7.5, the compound shall exhibit average char not greater than 6 inches. The combustion plus ignition time shall not exceed 4.25 minutes.

3.9.3 Resistance to jet exhaust blast. When the compound is tested as specified in 4.7.6, there shall be no flashing, flaming, burning or charring. After cooling there shall be no softening.

3.9.4 Resistance to detergent solution. When tested as specified in 4.7.7, the compound shall not soften, stain, streak, or show any appreciable loss in color.

3.9.5 Resistance to accelerated corrosion. When tested as specified in 4.7.8, the compound shall not soften or become detached, and there shall be no

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corrosion on the surface of the covering or on the surface of the aluminum beneath the covering. The corrosion on the uncovered portion of the aluminum plate shall not creep under the covering.

3.9.6 Resistance to moisture and temperature changes. When tested as specified in 4.7.9, the compound shall show no signs of cracking, separation from the aluminum plate, or corrosion of the aluminum plate beneath the covering.

3.9.7 Resistance to accelerated light and weather aging. When tested as specified in 4.7.10, the exposed surface on the covering shall show no appreciable change in color, signs of checking, cracking, or any other deterioration.

3.9.8 Resistance to wear. When tested as specified in 4.7.11, the compound shall not show wear greater than 0.022 inch.

3.9.9 Resistance to solvents. When tested as specified in 4.7.12, the compound shall show no signs of softening, loss of adhesion, or any other form of deterioration.

3.10 Nonslip properties. The factors of friction shall be not less than that specified in Table I when tested as specified in 4.7.13.

TABLE I

FACTORS OF FRICTION

Contacting Surface	Factor of Static Friction			Factor of Sliding Friction		
	Condition			Condition		
	Dry	Wet	Oily	Dry	Wet	Oily
Leather	0.85	0.85	-	0.50	0.60	-
Rubber	1.00	1.00	0.90	1.00	1.00	0.90

3.11 Serviceability. The deck covering compound shall show no loss of adhesion, degradation, uplifting, or break-through as a result of tire skid or other deficiency which would limit its serviceability when examined during and after the service period specified in 4.7.14.1.

* 3.12 Storage stability. The previously unopened packaged product shall meet any of the requirements of this specification for a period of two years, provided that the daily mean temperature of the ambient air at the storage location does not exceed 95 degrees Fahrenheit, and the peak ambient air temperature does not exceed 115 degrees Fahrenheit (see 4.7.15).

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3.13 Adherence. The compound, when applied, shall maintain a firm adherence to the structure, and shall protect metal surfaces from corrosion. It shall form a durable and neat appearing surface (see 4.7.16).

3.14 Workmanship. The component ingredients shall be intimately assembled and processed as required, in accordance with the best practice for the manufacture of high-quality deck covering compound.

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 supplies and services conform to the prescribed requirements.

4.2 Classification of inspection. The inspection of the deck covering compound shall be classified as follows:

(a) Qualification inspection (see 4.3).

(b) Quality conformance inspection (see 4.4).

4.3 Qualification.

4.3.1 Inspection. The qualification inspection of the deck covering compound shall consist of examinations and tests for all the requirements of this specification.

* 4.3.1.1 Retention of qualification. The retention of qualification of products approved for listing on the Qualified Products List (QPL) shall be maintained by periodic verification to determine compliance of the qualified product with the requirements of this specification. Unless otherwise specified by the activity responsible for the Qualified Products List, periodic verification shall be by certification and such certification shall be at intervals of not more than two years.

* 4.3.2 Sampling. Qualification test samples shall consist of two 5-gallon and 1-gallon containers of Component I, resin and abrasive, and sufficient samples of Component II, curing agent. Samples shall be selected and forwarded to the Commanding Officer, Naval Air Engineering Center, Engineering Department (SI), Philadelphia, Pa. 19112, Attn: Code NE-34. The samples shall be plainly identified by securely attached durable tags marked with the following information:

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SAMPLES FOR QUALIFICATION TESTS
COMPOUND, DECK COVERING, NONSLIP,
LIGHTWEIGHT, FOR ALUMINUM ALLOY
LANDING MATS
Manufacturer's name
Manufacturer's formula number
Submitted by (name of manufacturer) (date)
for qualification tests in accordance with the
requirements of Specification MIL-C-81346B(AS) (date)
under authorization (reference letter authorizing the test).

4.3.3 Report of tests. The manufacturer shall submit reports of his qualification product showing results of all the tests specified herein, except Serviceability. Regarding the composition of the compound, the manufacturer may report such results as "calculated," provided, in his opinion, analysis made by the Government will yield the same results.

4.4 Quality conformance inspection. Quality conformance inspection shall consist of all the tests and examinations of this specification except for Serviceability. Tests shall be divided into two categories: lot acceptance tests and comparison tests.

(a) Lot acceptance tests are those tests carried out on each production lot.

(b) Comparison tests are those tests carried out on the first lot offered for delivery under a contract or order, and for every 5,000 gallons thereafter.

4.4.1 Lot acceptance tests shall consist of the following tests:

Drying time (4.7.1)
Nonvolatile content (4.7.2.2)
Color (4.7.2)
Resistance to impact (initial only) (4.7.3, 4.7.4)

4.4.2 Comparison tests shall consist of the following:

Resistance to fire (4.7.5)
Resistance to impact (4.7.3, 4.7.4)
Resistance to corrosion (4.7.8)
Resistance to wear (4.7.11)
Resistance to solvents (4.7.12)
Nonslip properties (4.7.13)

4.5 Sampling.

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4.5.1 Lot. Unless otherwise specified, a lot shall consist of all the compound of the same type manufactured at one time for one batch, forming part of one contract or order and submitted for acceptance.

4.5.2 Sampling for lot acceptance inspection.

4.5.2.1 Sampling for examination of filled containers. A random sample of filled containers shall be selected in accordance with MIL-STD-105 at Inspection Level I and Acceptable Quality Level = 2.5 percent defective for the examination specified in 4.5.2.1.1.

4.5.2.1.1 Examination. Each filled container in the sample selected in accordance with 4.5.2.1 shall be examined to verify compliance with this specification. Any container in the sample having one or more defects or under required fill shall be rejected, and if the number of defective containers in any sample exceeds the acceptance number for the appropriate sampling plan of MIL-STD-105, the lot represented by the sample shall be rejected.

4.5.2.2 Sampling for lot acceptance tests. From each lot of material offered for delivery a two-quart sample of resin, Component I, shall be selected at random for the lot acceptance tests specified in 4.4.1. Sufficient accelerator or curing agent, Component II, shall also be selected to cure the base material. Where lots are small, only one 2-quart sample of base material shall be selected for each 500 gallons of material.

4.5.2.3 Sampling for comparison tests. From the first lot of a single type offered for delivery under a contract or order and for every 5,000 gallons thereafter, one 2-quart sample of base material (with sufficient accelerator or curing agent) shall be selected at random for the comparison tests specified in 4.4.2.

4.6 Test panels. All panels used for test purposes shall be aluminum alloy (6061T6) conforming to QQ-A-250/11. Panels shall be cleaned in accordance with MIL-M-7752, and deoxidized by use of chromic sulfuric type aluminum deoxidizing solution or aluminum oxide blasted. Surfaces after blasting, shall be smooth and uniform for test purposes.

4.6.1 Test specimens. Unless otherwise specified herein, specimens of the sizes as specified in the tests shall be made by spraying one coat of the compound onto 1/8-inch thick aluminum alloy plates described in 4.6. Total coverage of the compound shall be at the rate of 60 to 70 square feet per gallon and a wet-film thickness of 21 mil minimum. The coated aluminum specimens shall be cured for 96 hours before conducting tests. During panel preparation, the material under test shall be checked for conformance to the working properties requirements (3.8).

4.6.2 Temperature and humidity. Unless otherwise specified, laboratory temperature and humidity conditions shall be in accordance with FED-STD-601.

4.7 Test procedures.

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* 4.7.1 Drying. The specimens prepared as specified in 4.6.1 shall be evaluated during preparation for their rate of drying. When applied in the service evaluation specified in 4.7.14.1, the Type I compound shall be checked 24 hours after application of the coating and Type II compound shall be checked 6 hours after application to determine if the deck can be put to its intended use.

4.7.1.1 Type I, bake-dry. Panels as specified in 4.6 shall be coated and baked in accordance with manufacturer's recommendations for the material, and inspected for compliance with the baking requirement of 3.7.1.

4.7.2 Color. A panel 6 by 6 inches, prepared as specified in 4.6.1 shall be tested in accordance with Method 4250 of Federal Test Method Standard No. 141.

4.7.2.1 Odor. Odor of the compound shall be determined in accordance with Method No. 4401 of Federal Test Method Standard No. 141.

4.7.2.2 Nonvolatile content. The nonvolatile content of the admixed compound shall be determined in accordance with Method No. 4041 of Federal Test Method Standard No. 141.

* 4.7.2.3 Nonphotochemically reactive solvents. The nonphotochemically reactive volatile composition shall be determined using a gas chromatograph or other suitable device in accordance with Method 7360 of Fed. Test Method Std. No. 141.

4.7.3 Resistance to impact (Type I only).

4.7.3.1 Procedure. Four specimens, 6 by 6 inches, prepared as specified in 4.6.1, shall be conditioned as follows:

Specimen	Condition
1	- No further conditioning.
1	- 4 hours at 32°F.
1	- 4 hours at 158°F.
1	- 100 hours weather aging in an Eveready X-1a unit or equivalent.

4.7.3.2 Each specimen shall then be centrally positioned on a steel horizontal base plate 15 by 15 by 2 inches. A centrally located area 4 by 4 inches on the coated side of the specimen shall be subjected to 25 impacts of a 2-pound steel ball dropped from a height of 8 feet. The steel ball, which shall be held in a fixed position above the specimen by means of an electro-magnet provided with a centering tip, shall be dropped so that each impact area on the specimen shall be 3/4 inch on center from the preceding impact area.

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4.7.3.3 Resistance to hook impact and spinning wheel tests shall also be conducted in accordance with NAEC Test Directive No. CTL 385, Revision I, dated 4 November 1964 (Hook Impact Test) except that three instead of five impacts shall be used.

4.7.4 Resistance to hook impact and spinning wheel (Type II only). Three specimens, 2 by 2 feet, shall be prepared as specified in 4.6.1 except the dry time shall be a maximum of 6 hours at 75 ±5°F. Upon completion of the 6 hour dry time, the coated specimens shall be subjected to the resistance to hook impact and spinning wheel test in accordance with NAEC Test Directive No. CTL 385, Revision I, dated 4 November 1964 (Hook Impact Test) except that three instead of five impacts shall be used. Specimens should be firmly placed and rigid during tests.

4.7.5 Fire resistance test.

4.7.5.1 Apparatus. The fire resistance of the compound shall be determined by an apparatus as shown on Figures 1 and 2 which consists of communicating horizontal and vertical flues constructed of asbestos-board-lined steel sheets with the exception of the horizontal bottom plate which is all steel. The enclosure shall be 36 inches long over-all; the flue shall be 8 inches wide by 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 3. Details of the burner supply manifold and open burner nozzle are shown on Figure 4. A schematic flow diagram for the apparatus is shown on Figure 5 and a parts list is shown in Table II.

4.7.5.2 Procedure. The compound shall be applied to the specimen holder shown on Figure 3 by spraying the compound onto 1/8 inch thick mild steel plates that have been prepared by removing all rust, mill scale and organic matter and finished off by grinding the surface with No. 24 grit abrasive coated cloth or paper. The non skid compound coverage shall be at the rate of 60 to 70 square feet per gallon. The wet film thickness of the non skid compound shall be 21 mils minimum. The coated panels shall be cured for 96 hours before conducting tests. This holder is a 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. The holder 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 British thermal units 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 a 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 +0.01 -0.00 inch of water shall be maintained in the flue of the apparatus for the duration of the test.

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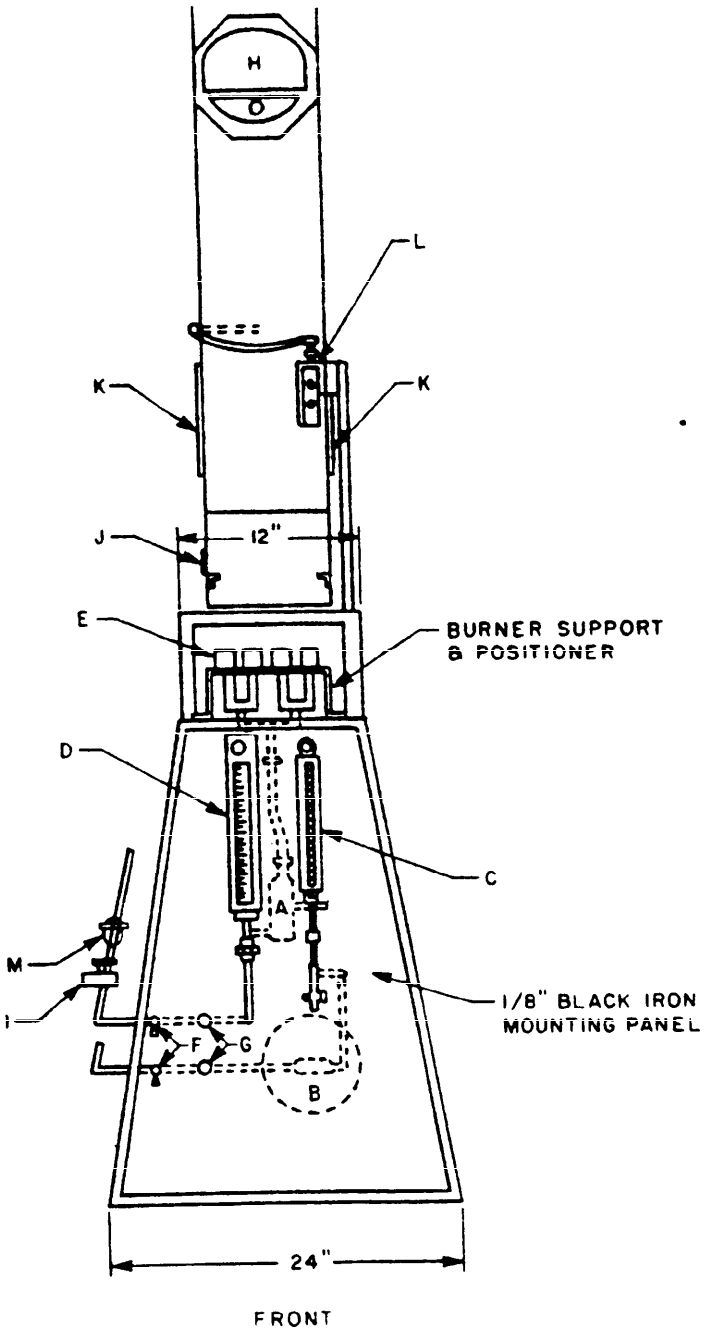

Figure 1. Fire test apparatus (front view)

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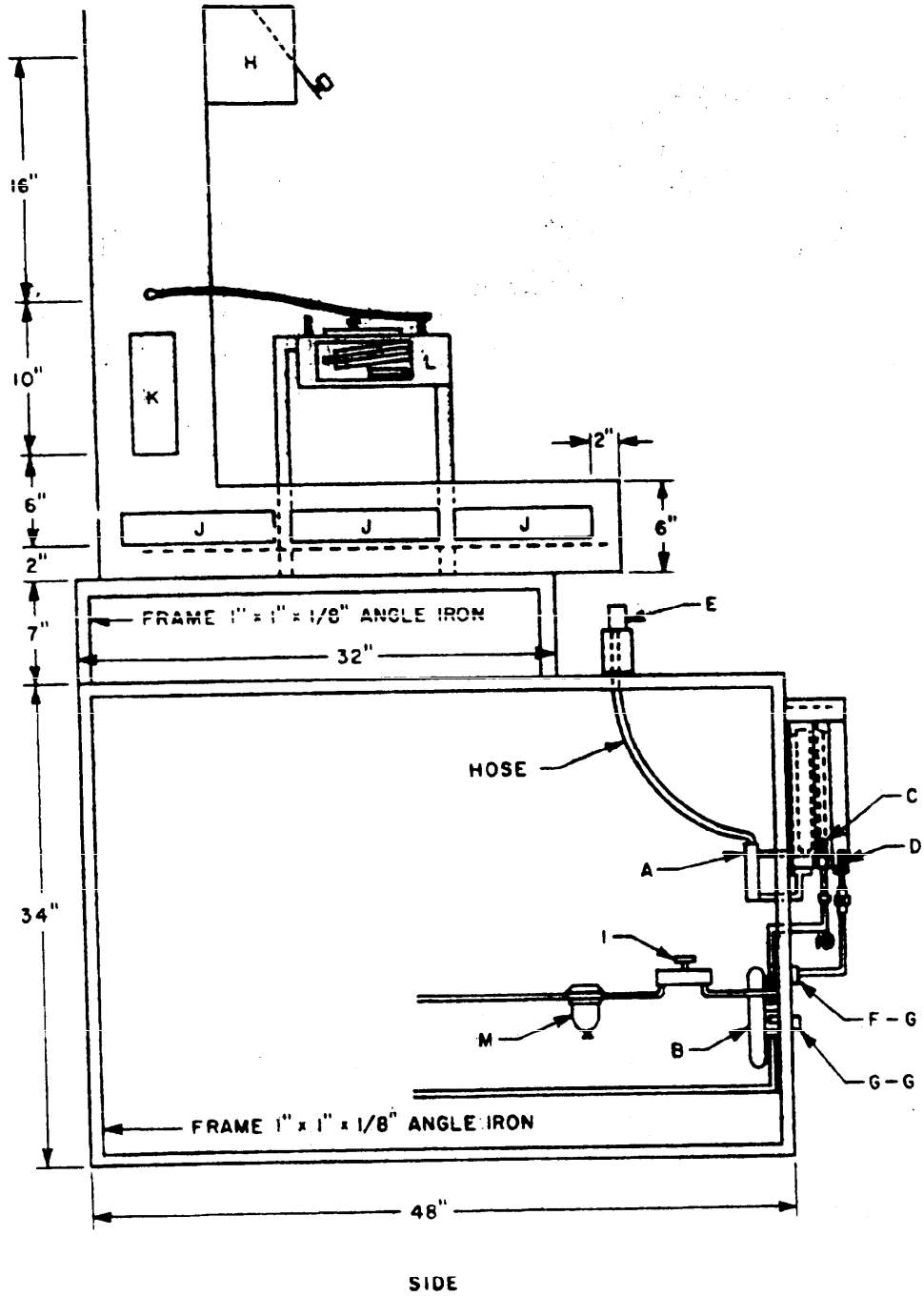

Figure 2. Fire test apparatus (side view)

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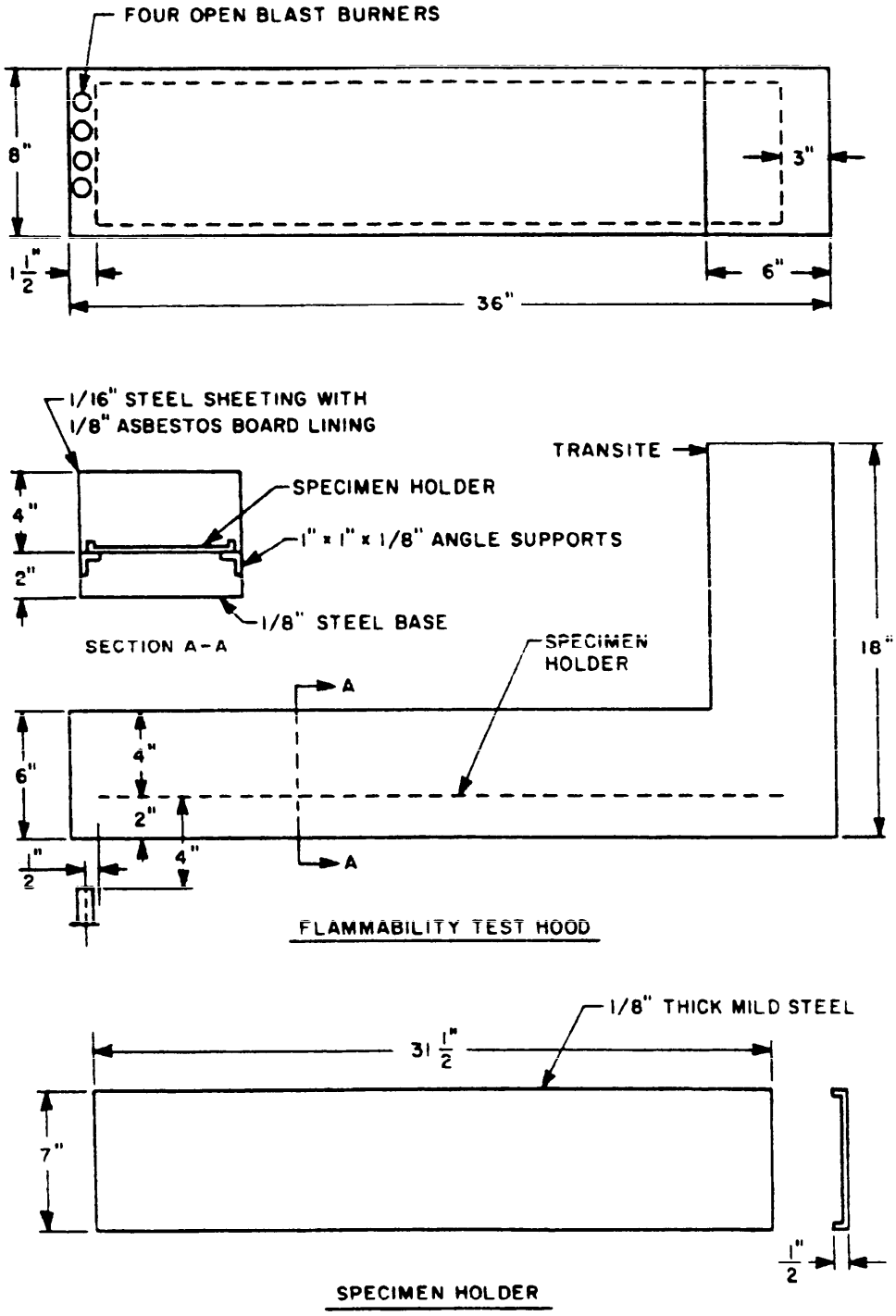

Figure 3. Detail of fire resistance test apparatus

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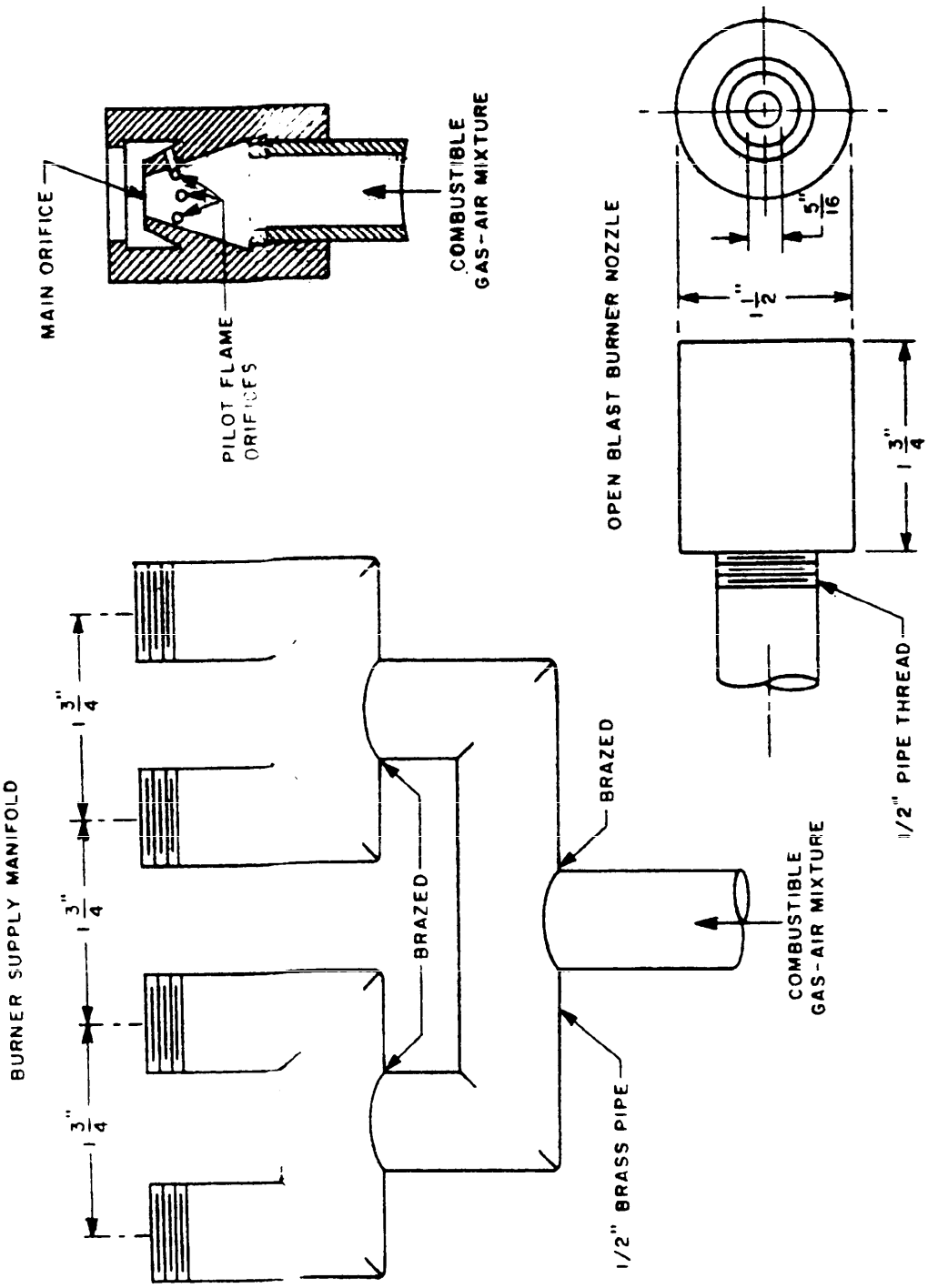

Figure 4. Burner supply manifold and open blast burner nozzle

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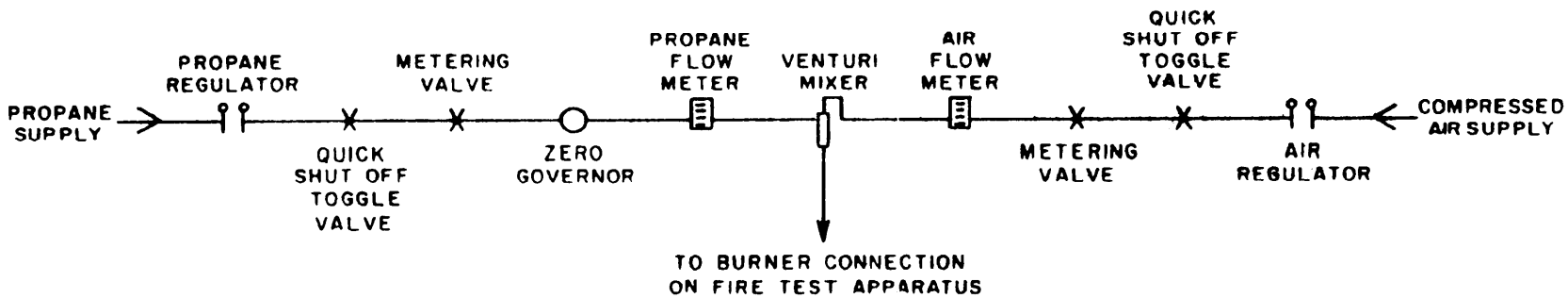

Figure 5. Schematic flow diagram for fire test apparatus

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TABLE II

FIRE TEST APPARATUS PARTS LIST

PART	QUANTITY	DESCRIPTION	FUNCTION	SUGGESTED SOURCE
A	1	Venturi Mixer #13-12	Mixing of Propane and Air	American Gas Furnace Co., Elizabeth, N. J.
B	1	Zero Governer for Propane #ZG-1	Reduction of Propane Pressure to Atmospheric	American Gas Furnace Co., Elizabeth, N. J.
C	1	Flowmeter, Propane-X15-155-3	Measurement of Propane Flow	American Gas Furnace Co., Elizabeth, N. J.
D	1	Flowmeter, Air- 3x5-100-6	Measurement of Air Flow	American Gas Furnace Co., Elizabeth, N.J.
E	4	Nozzles, Sticktite ST 2A, Alloy Steel	Control of Igniting and Heating Flame Characteristics	Eclipse Fuel Engineering Co., Rockford, Illinois
F	2	Toggle Valves #455, Brass	Gas and Air Quick Shut-off Valves	Hoke, Inc. Englewood, N. J.
G	2	Metering Valves, Straight Pattern, #4RB281	Fine Adjustment of Propane and Air Flow	Hoke, Inc. Englewood, N.J.
H	1	Oil Burner Type Draft Regulator	Maintenance of Constant Draft	Any Oil Burner Supply House
I	1	Nullmatic Pressure Regulator and Pressure Gage (0-60 psi) #40-H-50	Regulation of Air Pressure Supply to Apparatus	Moore Product Co., Philadelphia, Pa.
J	3	Windows, Vycor Glass, Ground and Polished 10-1/4 inch by 2-1/4 inch 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 inch by 3 inch by 1/8 inch	Viewing of Flames and Smoke	F.S. Gray and Co., Inc. 182 So. Portland Ave. Brooklyn, N.Y.
L	1	Inclined Draft Gage	Measurement of Draft in Flue	Ellison Draft Gage Co. 345 W. Monroe St. Chicago 6, Illinois
M	1	Air Line Filter	Removal of Contaminants From Air Supply	Commercial

NOTES: Blower, external exhaust and damper not shown. Damper to be installed not less than 12 inches upstream of draft regulator.

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4.7.5.3 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 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.

4.7.6 Resistance to jet exhaust blast.

4.7.6.1 Apparatus. The resistance of the compound to jet exhaust blast shall be determined by an apparatus which consists of a combustion tube and an open blast burner nozzle secured to a hinged platform. The combustion tube shall be a 10-inch length of 2-1/2-inch nominal pipe. The burner nozzle shall be located in line with and 2-7/8 inches behind the combustion tube. The burner nozzle shall be supplied with a mixture of propane gas, having a heating value of 2550 B.t.u. per cubic foot at 60°F and atmospheric pressure of 30 inches of mercury, and compressed air. This gas-air mixture shall be accomplished in a Venturi mixing chamber, or equivalent, to which the gas and air shall be supplied at a rate of 10.6 and 230 cubic feet per hour, respectively, when referred to standard conditions of 60°F and atmospheric pressure of 30 inches of mercury. The gas line shall contain a diaphragm regulated valve just in advance of the Venturi mixer, to reduce the gas supply pressure to atmospheric pressure to allow the fuel to be aspirated by the air passing through the Venturi mixer, and to serve as a safety device to prevent flash-backs through the gas line.

* 4.7.6.2 Procedure. Panels 6 by 6 by 1/8 inch, of mild steel from which all rust, mill scale and organic material has been removed, shall be finished by grinding the surface with No. 24 grit abrasive cloth or paper. The panels shall be sprayed with the sample compound at a rate of 60 to 70 square feet per gallon. The wet film thickness of the non skid compound shall be 21 mils minimum. The coated panels shall be cured for 96 hours before testing. The exhaust gases shall be applied to the surface of the specimen for 2 minutes and then immediately removed. The exhaust gases shall impinge on the coating surface of the test specimen at an angle of 15 degrees with the horizontal plane. A temperature of 1500°F shall be maintained at a point 1/4 inch above the test specimen and 3 inches from the exhaust end of the burner tube which shall rest on the surface of the test specimen during the conduct of the test.

4.7.7 Resistance to detergent solution. A specimen 6 by 2 inches, prepared as specified in 4.6.1, shall be immersed for one hour in the solution specified below, so that a 3-inch section of the specimen is immersed in the solution and the upper half remains unexposed for purposes of comparison. The liquid solution shall be

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made by dissolving soap power in tepid water to form a 1/2 of 1-percent solution, then adding lamp black until the solution is dark gray. The temperature of the solution shall be 70 ±2 °F. After immersion, the specimen shall be rinsed for 1 minute with tap water at 140 °F, and dried with an air jet. The specimen shall then be examined for softening, stains, streaking, or loss of color.

4.7.8 Resistance to corrosion.

4.7.8.1 Apparatus. The apparatus shall consist essentially of a glass jar with a specimen rack, containing salt solution through which air is bubbled to accelerate corrosion. The glass jar shall be a nominal 4-1/2 gallon container 12 inches in diameter and 12 inches high. Into this container a cylindrical specimen rack and air-distribution manifold shall be placed. The shelves shall be of 1/4 inch bakelite and shall have bakelite separators to serve as legs and as spacers. Each shelf shall be perforated with numerous 1/2 inch diameter holes. Air at the rate of 0.3 cubic feet per minute shall be bubbled through a water column approximately 6 inches high and introduced into the solution through a manifold and interlaced ring assembly. The ring assembly shall be made of 1/4 inch diameter plastic tubing and shall have a total of fifty-one 3/64 inch diameter holes. (It is to be noted that no metal is used in any part of this apparatus.)

4.7.8.2 Procedure. Four specimens 6 by 2 inches shall be prepared in accordance with 4.6.1.

4.7.8.2.1 A band of the compound 1 inch wide shall be scraped off one end of each specimen so as to expose the bare metal. The specimens shall be placed on the shelves with the test material face up, and the glass jar filled to within approximately 3 inches from the top with a 10 percent salt (NaCl) solution. The specimens shall be immersed in the salt water solution for 15 days at 70 ±2 °F, during which time a continuous stream of air shall be passed through the solution in order to promote corrosion. The level of the salt water solution shall be maintained by the addition of distilled water.

4.7.9 Resistance to moisture and temperature changes. Tests shall be made on two specimens 6 by 2 inches. Each specimen, prepared as specified in 4.6.1, shall be immersed in a solution of 4 percent sodium chloride in water, under a pressure of 8 pounds per square inch, for 48 hours. Immediately after immersion the specimen shall be subjected to two complete cycles of alternate exposure to a temperature of 0 ±5 °F for 24 hours, followed by a temperature of 120 ±5 °F for 24 hours. The specimen shall then be examined for evidence of cracking or other failure. A portion of the compound shall be carefully removed from the plate, to permit observation of any signs of corrosion under the compound.

4.7.10 Resistance to light and weather aging. Test specimen 6 by 2 inches, prepared as specified in 4.6.1, shall be exposed to light from a flaming carbon arc such as Eveready X-1a unit for 200 hours, and intermittently sprayed with tap water.

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The face of the material normally exposed in service shall be directed toward the light source. The light source and weathering unit, method of calibrating or evaluating the light source, and evaluation of total exposures to ultra-violet light shall be in accordance with Method 7311 of FED-STD-601, except that the Corex-D filters shall be removed. The exposed surface of the test specimen shall be examined and compared with an unexposed specimen of the same size with respect to discoloration, cracking, checking, crazing, or other signs of deterioration.

4.7.11 Resistance to wear. Three specimens 3 by 2 inches, prepared as specified in 4.6.1 except that two full coats shall be applied, shall be positioned so that an area of approximately 6 square inches of coating is presented to the abrasive in the machine described herein. The abrasive grit shall be number 80 aluminum oxide. Before wear-testing, the thickness shall be measured at 12 equally distributed points on the specimen by means of a dial thickness gage and a template. Unless otherwise specified in the contract or order, the specimen shall then be subjected to 100 revolutions of the wear-testing machine, and the thickness obtained at the same points previously measured. The differences in thickness shall be averaged to determine the thickness of material worn away by the abrasive.

4.7.11.1 Wear-test machine. The wear-test machine shall have the following essential mechanical characteristics:

a. Mild steel, abrasion disk, 14-1/8 inches in diameter and 1/2 inch thick, revolved clockwise at a constant speed of 23.5 revolutions per minute (rpm).

b. Specimen holder, 2 by 4 inches, attached to a 5/8 inch diameter shaft by means of a universal coupling. The distance between centers of the disk and the specimen holder shaft shall be 5.1 inches. A specimen of decking material shall be secured in the specimen holder by means of clamps at each end of the holder. The holder shall revolve clockwise at a constant speed of 32.5 rpm.

c. Hardened tool-steel cam attached to the specimen holder shaft by means of set screws. In each one-half revolution of the shaft the specimen shall be lifted a distance of 1/16 inch and then dropped back on disk under a 10-pound weight. Change in the lift due to wear of the specimen shall be compensated by adjustment of the cam at regular intervals, so that the lift is maintained at a practically constant distance.

d. Weight, 10 pounds, the maximum found suitable for use with this test machine.

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e. Distributor for abrasive grits. The grits flow by gravity from the hopper through a 13/16-inch inside diameter tube and into the center of the distribution chamber. An impeller in the chamber shall provide an evenly distributed feed of the grits through eight 3/64-inch diameter holes centered on a 1-5/8 inch diameter pitch circle. A uniform distribution of grits shall fall to the disk in the path of the test specimen. The distributor shall be revolved at a constant speed of 9 rpm.

f. Hopper for feeding abrasive grits

g. Bevel drive gear

h. Predetermining revolution counter and switch

i. One-third horsepower, compound-wound, direct-current motor

j. Hopper for collecting used abrasive grits

k. Steel frame

4.7.11.2 Procedure. As the steel disk revolves, the weighted specimen of the material in the holder shall be lifted and dropped by a cam while it is being revolved. When the specimen is dropped through motion of the cam, it shall fall a distance of 1/16 inch and meet the disk with impact simulating the fall of a foot on the deck surface. Foot action shall be further simulated in that the revolving specimen shall contact the disk with a sliding and twisting motion until lifted clear by the cam. Continuous rotation of the specimen shall introduce the element of wear in all directions on the material. Free abrasive grits of No. 80 aluminum oxide shall be fed at a steady rate from the hopper and distributed uniformly on the steel disk in the path of the specimen. The revolving motions of the steel disk and the test specimen shall keep the abrasive grits circulating to the outer side of the path of the specimen. The grits shall fall from the edge of the steel disk into the hopper, from which they shall be collected and then screened to eliminate undesired particles before replacement in the upper feeding hopper.

4.7.12 Resistance to solvents. Six specimens 6 by 6 inches, prepared as specified in 4.6.1, shall undergo the following immersion treatments at 70 ±2°F:

a. Two specimens immersed in SAE 10W oil for 24 hours

b. Two specimens immersed in aircraft fuel conforming to Grade 115/145 of MIL-G-5572 for 15 minutes

c. Two specimens immersed in jet aircraft fuel conforming to Grade JP-5 of MIL-T-5624 for 24 hours

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d. Two specimens immersed in diester lubricating oil composed of 95 percent di-2 ethyl-hexyl sebacate 1/ and 5 percent tricresyl phosphate by weight at a temperature of 121 ±2°C (250 ±4°F) for a period of 24 hours.

1/ Di-2 ethyl-hexyl sebacate may be obtained commercially as "Plexol 201" from Rohm and Haas.

4.7.12.1 Upon removal from the immersion medium the compound shall be examined for softening, loss of adhesion, or any other deterioration.

4.7.13 Nonslip properties. A specimen 2 by 4 inches, prepared as specified in 4.6.1, shall be used to determine the respective factor of friction of the compound against leather and rubber. The leather shall be oak-tanned sole leather which has been sanded smooth with grade O garnet paper. The rubber shall be vulcanized compound with a hardness range of 60-80 Durometer "A". Tests shall be made with the contact surfaces dry; wet with a solution of 4 percent sodium chloride in water; and oiled, using SAE 10W oil. A load of 33 pounds shall be applied uniformly over the specimen. The determination of static and sliding friction shall be made by determining the pull on a spring balance required to start the test piece from rest and then to maintain a constant velocity. The factor of friction shall be determined by using the average of four readings in the following equations:

$$\text{Factor of Static Friction} = \frac{\text{Pull in pounds required to start test piece from rest}}{33}$$

$$\text{Factor of Sliding Friction} = \frac{\text{Pull in pounds required to maintain test piece at constant velocity}}{33}$$

4.7.14 Serviceability.

4.7.14.1 The compound shall be applied to an aluminum alloy landing mat, and shall undergo a minimum six months service evaluation.

* 4.7.15 Storage stability. A full, closed container of Component I with sufficient accelerator, packaged separately, shall be stored under the conditions specified in 3.12 for 2 years. At the end of storage, the containers shall be opened and inspected and tested for conformance to this specification.

4.7.16 Adherence test. Adherence test shall be conducted in accordance with NAEC Test Directive No. CTL 385, Revision I, dated 4 November 1964 (Spinning Wheel Test).

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4.7.17 Inspection for packaging, packing, and marking. The material shall be inspected for all the requirements of Section 5.

4.7.17.1 For kits furnished as specified in 5.3b, the manufacturer shall submit a notarized certificate signed by a responsible official of its management attesting to the effect that the furnished type package will meet the requirements of 5.2.1 for a minimum period of two years.

4.8 Rejection.

4.8.1 Lot acceptance. If a sample fails any of the tests specified in 4.4.1 the lot represented by the sample shall be rejected.

4.8.2 Comparison test acceptance/rejection. Acceptance of the first lot offered for delivery under a contract or order shall be withheld until a satisfactory report is received on the comparison test sample. Thenceforth, except as hereinafter specified, acceptance and rejection of lots shall normally be on the basis of the sampling, examination, and tests specified in 4.4.1 and 4.5.2.1.1, and acceptance shall not be withheld pending receipt of test reports on comparison test samples. However, upon receipt of an unsatisfactory test report on a comparison test sample, that lot shall be rejected and additional samples shall be selected from every subsequent lot offered for delivery. The samples so selected shall be subjected to the test or tests wherein failure occurred. Lots shall then be accepted only upon receipt of a satisfactory test report on the samples so selected.

5. PREPARATION FOR DELIVERY

5.1 Component I (resin). Component I shall be packaged in 5-gallon lug cover steel pails or in 55-gallon steel drums as specified (see 6.2). Component I shall be packaged Level A or C, packed Level A, B, or C as specified (see 6.2) in accordance with TT-P-143. Sufficient head room shall be allowed in the pails or drums for the addition of Component II and the mixing operation.

5.2 Component II (catalyst) (For shipment with drums). Unless otherwise specified in the contract or purchase order (see 6.2), Component II shall be packaged in the size container necessary to contain the manufacturer's recommended volume for use with Component I. Component II shall be packaged Level A or C, packed Level A, B, or C as specified (see 6.2) in accordance with TT-P-143. Unless otherwise specified, Component II package shall be attached to the Component I drum head.

* 5.2.1 Component II package (for shipment in 5-gallon pails). When specified in the contract or purchase order (see 6.2), Component II catalyst shall be packaged in a container which is placed in the 5-gallon pail containing Component I resin. The package containing Component II shall not cause reaction to the resin or be reacted on by the resin, and shall be capable of containing and preventing the catalyst from reacting with the resin for a minimum period of two years.

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5.3 Kits. The deck covering compound shall be supplied in a kit packaged as a unit consisting of Component I and Component II. Unless otherwise specified, the kits shall be furnished in the following sizes:

a. 55-gallon drum (see 5.1 and 5.2)

b. 5-gallon pail (Component II packed within the pail) (see 5.1 and 5.2.1)

5.4 Additional marking and labeling. In addition to markings required by TT-P-143, individual containers and exterior shipping containers shall be marked in accordance with MIL-STD-129. Individual cans and containers shall bear a printed label (all printed labels shall be overcoated with a clear coating for weather-proofing) showing the following nomenclature and information as applicable:

Type I or II, as applicable
Component identification:
  Component I - Pigmented Abrasive Compound
  Component II - Accelerator or Curing Agent
Specification MIL-C-81346B(AS)
Color (name and number)
Manufacturer's name or trade-mark
Date manufactured (month and year)
Weight per gallon
Mixing, thinning and spraying directions (direction labels shall be clearly legible)
Location of Component II (specify whether packaged within the pail or separately, as applicable)

Precautions:

1. Surface skin shall be absolutely clean (free from oil, dust).
2. Equipment shall be adequately grounded. Clean spray gun, brushes and equipment immediately after use, with thinner.
3. Do not mix materials that are not homogeneous. Set containers aside.
4. Mix only that amount which can be used within 4 hours to avoid gelation in the pot.
5. Coating from one vendor shall never be mixed with that of another.
6. Components from one vendor are not interchangeable with those of another.
7. Do not store containers above 95°F.
8. Store under protective covering.

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Thinning directions -

Instructions for use, including:

1. Brand name.
2. Preparation of surface, including cleaning agents if required.
3. Method of application.
4. Thickness (within the specified limit) and coverage in square feet per gallon.
5. Drying rate.
6. Safety precautions during application.
7. Working life.

6. NOTES

* 6.1 Intended use. Type I deck covering compound is intended for use as a nonslip coating on aluminum alloy airfield landing mats. Type I, air-dry compound, is capable of being used after 24 hours dry time and the Type I bake-dry compound, after 1 hour. Type II compound is intended for use (6 hours air-dry) as an emergency repair kit for infield repair and recoating damaged or worn landing mats.

* 6.2 Ordering data. Procurement documents should specify the following:

a. Title, number, and date of this specification

b. Type required (see 1.2)

c. Color number (see 3.6)

d. Kit size (see 5.3)

e. Level of packaging and packing required (see 5.1 and 5.2)

6.2.1 The compound covered by this specification should be purchased by volume, the unit being one U.S. gallon (231 cubic inches at 15.5°C (60°F).

6.3 Color chips may be obtained by bonafide contractors only upon application to the Commandant of the Marine Corps, Headquarters, Marine Corps, Attn: Code CSY-10, Washington, D.C. 20380.

6.4 Qualification. With respect to products requiring qualification, awards will be made only for products which are at the time set for opening of bids, qualified for inclusion in the applicable Qualified Products List whether or not such products have actually been so listed by that date. The attention of the suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products

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covered by this specification. The activity responsible for the Qualified Products List is the Commander, Naval Air Systems Command, Department of the Navy, Washington, D.C. 20360; however, information pertaining to qualification of products should be obtained from the Commanding Officer, Naval Air Engineering Center, Code NE34, Philadelphia, Pennsylvania 19112.

6.4.1 It is to be understood that the material furnished under this specification subsequent to final approval will be of the same composition and will be equal in serviceability resistance to products upon which approval was originally granted. In the event that the material furnished is found to deviate from the composition of the approved product, or the product fails to meet specification requirements, approval of such material will be subject to immediate withdrawal. Requalification will be contingent upon successful completion of all tests, including the Serviceability resistance test. Consideration will be given to minor changes in the approved composition upon written request to the activity responsible for qualification accompanied by all forms required for initial qualification, with the exception of wet samples and test exhibits, which are not required.

6.5 Marginal indicia. The margins of this specification are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only, and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

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DOCUMENT IDENTIFIER AND TITLE MIL-C-81346B(AS) COMPOUND, DECK COVERING, NONSLIP, LIGHTWEIGHT FOR ALUMINUM ALLOY LANDING MA

NAME OF ORGANIZATION AND ADDRESS

CONTRACT NUMBER

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

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A. GIVE PARAGRAPH NUMBER AND WORDING.

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