

MILITARY SPECIFICATION

HOSE, AIR DUCT, FOR GROUND HEATERS

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers air duct hose assemblies for ground heaters.

1.2 Classification. The hose assemblies shall be of the following sizes and length as specified. (See 6.2)

a. Size A shall be 12 inches nominal diameter, 15 feet nominal length.

b. Size B shall be 6 inches nominal diameter, 15 feet nominal length.

*1.3 Part number. Specification part number for items described in this document will be formulated as shown in section 6.3.

2. APPLICABLE DOCUMENTS

*2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

FEDERAL

QQ-W-428	Wire, Steel, High Carbon, Round, Uncoated for Mechanical Springs, (General Purpose).
PPP-B-576	Box, Wood, Cleated, Veneer, Paper Overlaid.
PPP-B-585	Box, Wood, Wirebound.
PPP-B-591	Boxes, Shipping Fiberboard, Wood Cleated.
PPP-B-601	Boxes, Wood, Cleated Plywood.
PPP-B-621	Box, Wood, Nailed and Lock-Corner
PPP-B-665	Boxes, Paperboard, Metal Edged and Components.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: the Engineering Division, San Antonio ALC/MMEDO, Kelly AFB, TX 78241-5000 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 4720

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

MILITARY

MIL-P-116	Preservation, Methods of.
MIL-L-10547	Linears, Case, and Sheets, Overwrap, Water Vaporproof and Waterproof Flexible Flexible.
DOD-D-1000	Drawings, Engineering and Associated Lists.

STANDARDS

FEDERAL

* FED-STD-191	Textile Test Methods.
FED-STD-595	Colors.
FED-STD-751	Stitches, Seams and Stitchings.

MILITARY

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129	Marking for Shipment and Storage.
MIL-STD-130	Identification Marking of U.S. Military Property.
MIL-STD-143	Standards and Specifications, Order of Precedence for the Selection of.
MIL-STD-810	Environmental Test Methods.
MIL-STD-831	Test Reports, Preparation of.

*2.1.2 Other Government documents. The following other Government document forms a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

DRAWINGS

AIR FORCE

50C24031	Coupling, Female, 12 Inch Air Duct.
50A24032	Pin, Female Coupling.
50C24033	Coupling, Male, 12 Inch Air Duct.
50C24045	Coupling, Female, 6 Inch Air Duct.
50C24046	Coupling, Male, 6 Inch Air Duct.
50B24066	Band, Female Coupling, 12 Inch Air Duct.
50B24067	Band, Male Coupling, 12 Inch Air Duct.
50B24068	Band, Female Coupling, 6 Inch Air Duct.
50B24069	Band, Male Coupling, 6 Inch Air Duct.

* (Copies of specifications, standards, and other Government documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

*2.2 Other publications. The following document forms a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issue of the non-government documents which is current on the date of the solicitation.

Official Classification Committee Uniform Freight Classification Rules

(Application for copies should be addressed to the Official Classification Committee, 1 Park Avenue at 33rd Street, New York, NY 10016.)

American Society for Testing and Materials

- * D430-73 Rubber Deterioration, Dynamic Fatigue - Tests for.
 D471-79 Method of Test for Changes in Properties of Rubber
 and Rubber-Like Materials In Liquid.
 D3951 Packaging, Commercial.

(Copies of ASTM publications may be obtained from the American Society of Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

American Society of Mechanical Engineers

Fluid Meters Sixth Edition

(Copies of ASME publication may be obtained from the American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017.)

- * (Nongovernment standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.

*2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, (except for associated detail specifications, specification sheets or MS standards) the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

- *3.1 First article. When specified, sample shall be subjected to first article tests (see 4.4 and 6.5).

3.2 General.

3.2.1 Hose assemblies. Hose assemblies covered by this specification shall be designed for use with portable heating equipment and shall be constructed of strong pliable fabric properly treated with a nonpermeable material for continuous use in extreme weather conditions. Quick-disconnect type coupling halves shall be installed on both ends of the hose. A male type coupling (see 3.4.3.1) on one end and a female type coupling (see 3.4.3.2) on the opposite end. A continuous metal stiffener, helical form, (see 3.4.4) extending the entire length of the hose shall be secured to the hose fabric and bonded to the couplings at each end for safe discharge of static electricity. A scuff strip, helically wound over the metal stiffener, shall be attached to the hose as an integral part of the assembly to protect the outside surface against abrasion. A storage device, with a hook on one end and a catch on the opposite end shall be securely attached to the end couplings and protrude inwardly to serve as a guide for retracting the hose and for holding the hose assembly in a retracted handling and storing position.

- *3.2.2 Selection of specifications and standards. Standards and specifications for necessary commodities and services, which are not specified herein shall be selected in accordance with MIL-STD-143.

3.2.3 Standard parts. Military Standards (MS) parts and Army - Navy aeronautical (AN) parts shall be used whenever they are suitable for the purpose and shall be identified on the contractors drawing by the applicable MS or AN part number. Commercial utility parts may be used provided they possess the suitable properties and are replaceable with the standard MS or AN parts without alteration.

3.3 Material. Unless otherwise specified, materials shall be in accordance with the specification requirements referenced in the applicable document for each individual part. When not specifically specified, materials shall be as described herein and shall withstand all the applicable test requirements of this specification.

3.3.1 Protective treatment. Materials that are subject to corrosion in salt-laden air or other atmospheric conditions shall be protected against such corrosion in a manner that will in no way prevent compliance with the performance requirements of this specification. The protective coating shall not crack, chip or scale with age or extremes of climatic and environmental conditions.

3.3.2 Fire resistance. All materials used in the construction of hose assemblies shall be fire resistant.

3.4 Design and construction.

3.4.1 Hose. The hose shall be designed for continuous use in inclement weather conditions and shall withstand internal pressures ranging from a positive 2 inches Hg (gage) to a negative 1 inch hg, relative to surrounding atmosphere, while in a fully extended position without rupture or damage to the hose. The construction shall be such that the hose may be retracted to 10 percent of the normal length and when used in conjunction with heating equipment extreme low temperature conditions the hose may be connected to the heater or other hoses by personnel wearing heavy arctic gloves. The hose shall withstand a tensile pull of 250 pounds without rupture or evidence of damage. The internal surface and the built-in storage device shall be so constructed that air friction losses shall not exceed the following values when tested at the atmospheric pressure and temperatures specified in 4.3.1.5.

- a. Size A hose, 0.40 inch of water with a 2,000 cubic feet per minute (cfm) airflow.
- b. Size B hose, 0.70 inch of water with a 500 cfm airflow.

3.4.2 Fabric. The fabric used in construction of the hose shall be strong pliable strips, coated with a nonpermeable material, and of sufficient width to produce a pitch of not more than two-thirds of the hose diameter when helically wound upon itself with overlapping edges between which shall be laid the helical stiffener. The overlapping edges shall be of sufficient width to retain the stiffener and to provide a satisfactory base for attaching the scuff strip. The fabric shall not be severely affected by prolonged exposure to adverse weather conditions and shall withstand all the applicable tests specified herein.

3.4.3 Couplings. Each section of hose shall have male type coupling on one end and a female type coupling on the opposite end, securely attached as an integral part of the hose assembly. The hose fabric shall be attached to the outside diameter of the couplings and secured with protector bands conforming to Drawings 50B24066 and 50B24067 for the size "A" hose and 50B24068 and 50B24069 for the size "B" hose. The distance from the end of the hose fabric and protector band to the extreme end of the male coupling shall be no less than 1-1/8 inch.

3.4.3.1 Male type coupling. The dimension, configuration and material requirements for the male type couplings shall be in accordance with Drawings 50C24033 for the size "A" hose and 50C24046 for the size "B" hose.

3.4.3.2 Female type coupling. The dimensions, configuration and material requirements for the female type couplings shall be in accordance with Drawings 50C24031 for the size "A" hose and 50C24045 for the size "B" hose. The female couplings shall have three pins, conforming to Drawing 50A24032, securely attached at three equally spaced intervals around the circumference and protruding inwardly for receiving the connecting slots on the male couplings.

3.4.4 Helical stiffener. Unless otherwise specified, the stiffener shall be made of wire conforming to QQ-W-428, type 1, helically wound to a diameter equal to the specified hose size. The stiffener wire shall be of sufficient size and resilience to prevent transverse collapsing, excessive area reduction in the hose during sharp bends and shall return the hose to a circular shape after flattening the hose to 50 percent of the diameter. The helical pitch shall be sufficiently greater than the seam pitch on the hose to exert the required axial tension to extend the hose to its full length, when placed on a flat horizontal surface, and to maintain the hose in a fully extended position. However, the rigidity of the stiffener shall not interfere excessively with the retraction of the hose to its storage position. The stiffener shall have closed ends, square with the hose center line and securely bonded to the couplings at both ends to insure safe discharge of static electricity.

3.4.5 Scuff strip. The scuff strip shall be made of tough pliable material, helically wound around the outside diameter of the hose over the helical stiffener to protect the hose against abrasion and securely attached to withstand the test described in 4.8.10.2. The scuff strip shall not prevent or interfere excessively with retracting the hose to the storage position.

3.4.6 Storage device. A built-in storage device shall be internally located in each section of the hose assembly and will serve as a guide for retracting the hose and for retaining the hose in a retracted storage position. The device shall be free from burrs, sharp edges and rough surfaces which could abrade or damage the internal surface of the hose during extension and retraction. All welding shall be of the fusion type and the welded areas shall be properly treated to resist corrosion. In the event cleats are used for attaching the device to the couplings, two rivets shall be used on each end of the cleats.

3.4.7 Seams and stitching. Seams and stitching shall be in accordance with FED-STD-751. The seam shall be type LSa-2 and the stitching shall be type 301. The distance from the edge of the seam and the space between rows of stitching shall be not less than 1/8 inch. Not more than two bobbin breaks will be allowed in a 90 foot length of seam and where breaks occur the break shall be backed stitched for a distance of not less than 1 inch.

3.4.8 Seams cemented. Cement may be used to join the overlapping edges of the hose fabric provided that the facilities and process employed for cementing the first article samples will be the same facilities and process employed in the manufacture of production run hoses. The cemented hose assemblies shall be subjected to the first article tests specified herein and the samples submitted to the contracting officer for approval before commencing the production run.

3.5 Performance. The hose assembly shall be capable of delivering hot air at a temperature of 350°F for a minimum period of 2 hours when subjected to ambient temperatures ranging from minus 65°F to plus 50°F without evidence of scorching or other harmful effects. (See 4.8.4.) The hose assembly shall be subjected to the following conditions without detrimental effects to the normal operating requirements.

- a. Exposure to salt spray. (See 4.8.6.1)
- b. Fungus growth as encountered in tropical climates. (See 4.8.6.2)
- c. Radiant energy as found under natural conditions. (See 4.8.6.3)
- d. Exposure to fuels and lubricants. (See 4.8.11)

*3.6 Interchangeability. All parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable. The male and female couplings shall be completely interchangeable between heaters, adapters and hoses. Changes in manufacturer's part numbers shall be governed by drawing number requirements of DOD-D-1000.

3.7 Dimensions and weight.

3.7.1 Extended length. The diameter and length of the hose assembly shall conform to the following dimension when in a fully extended position.

- a. Size "A" inside diameter, 12 inches plus 1/4 inch, minus 0 inch. Length 15 feet plus 1 inch, minus 0 inch.
- b. Size "B" inside diameter, 6 inch plus 1/4 inch, minus 0 inch. Length 15 feet plus 1 inch, minus 0 inch.

3.7.2 Retracted length. The diameter, length and weight of the hose assembly shall not exceed the following dimensions when in a fully retracted storage position.

- a. Size "A" outside diameter, 13-1/2 inches. Length 18 inches. Weight 18 pounds.
- b. Size "B" outside diameter, 7-1/2 inches. Length 18 inches. Weight 10 pounds.

*3.8 Color. The hose fabric shall be dark green color 24052 in accordance with FED-STD-595.

3.9 Identification of product. The hose assembly and all component parts shall be marked for identification in accordance with MIL-STD-130. The hose assembly definitive part number (see 6.3) shall be marked on the hose fabric by the most convenient means e.g. ink stamp etc.

3.10 Workmanship. The fabric shall be free from irregular thread count, filling breaks and defective surface coating. All seams and stitching shall conform to the requirements specified in 3.4.7. Couplings and the storage device shall be free from burrs, sharp edges and surface roughness which could result in injury to personnel or cause damage to the hose fabric. The coupling shall be sufficiently round to rotate and completely engage at 120° intervals. All corrosive type materials shall be properly treated to resist corrosion when subjected to the exposure conditions specified herein.

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. Except as otherwise specified in the contract or purchase order, the contractor 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 prescribed requirements.

*4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 Components and material inspection. In accordance with 4.1 the contractor is responsible for insuring that components and materials used are manufactured, tested and inspected in accordance with the requirements of referenced subsidiary specifications and standards to the extent specified herein, or if none, in accordance with this specification.

4.2 Classification of tests. The inspection and testing of hose shall be classified as follows:

- a. First article (see 4.4).
- b. Acceptance tests (see 4.5, 4.6, and 4.7).

4.3 Test conditions.

4.3.1 Apparatus. Insofar as practicable, apparatus used for testing shall be of the laboratory-precision type and calibrated at properly spaced intervals to assure laboratory accuracy.

4.3.1.1 Airflow. Airflow shall be measured by means of smooth approach orifices or thin plate orifices in accordance with ASME Fluid Meters. Apparatus such as pitot tubes, rotometers, et cetera, may be used only when specifically approved by the procuring activity. The rate of airflow shall be expressed in cubic feet per minute, (cfm).

4.3.1.2 Barometric pressure. Barometric pressure shall be measured by means of a mercurial barometer. The barometric pressure shall be corrected according to the temperature of the scale and mercury and the location of the barometer with regard to the altitude and latitude. Readings obtained by aneroid barometers shall not be acceptable.

4.3.1.3 Temperature. Temperature shall be measured by means of appropriately located thermocouples. Insofar as practicable, the thermocouple shall be insulated to prevent contact with other metals. Temperatures shall be expressed in degrees Fahrenheit. Test temperatures shall be within plus or minus 4⁰F of those specified herein.

4.3.1.4 Pressure. Insofar as practicable, pressure and pressure differentials shall be measured by means of water manometers having a scale graduated in 0.01 inch of water. Pressures that exceed the range of conventional water manometers shall be measured by properly calibrated Bourdon-Tube gages. Gages shall be laboratory-precision type and shall have a dial diameter of not less than 4 inches.

4.3.1.5 Atmospheric conditions. Unless otherwise specified, tests shall be conducted at prevailing atmospheric conditions and at temperatures ranging from 70⁰ to 80⁰F.

4.4 First article test. The first article samples shall be subjected to all the examinations and tests specified in this specification.

4.4.1 Test samples. Unless otherwise specified, the contractor shall subject two size A hose, two size B hose and sufficient samples of new hose fabric, scuff strip materials and stitching materials to the tests specified herein. When specified, this testing shall be under the supervision of the procuring activity.

4.4.2 Test data. Upon completion of the first article test, the contractor shall prepare first article test reports in accordance with MIL-STD-831 and furnish 3 copies of the report with the rest samples and materials to the procuring activity for approval.

4.5 Sampling for lot acceptance.

4.5.1 Inspection lot. All of the hose of the same type and size offered for delivery at one time shall be considered a lot for the purpose of inspection and test.

4.5.2 Sampling for examination. Random samples of hose shall be selected from each lot offered to the Government in accordance with MIL-STD-105 at inspection level II. The Acceptance Quality Level shall be 2.5 percent defective.

4.5.3 Sampling for test. Random samples of hose shall be selected from each lot offered to the Government in accordance with MIL-STD-105 at inspection level S-4. The AQL shall be 1.5 percent defective.

4.6 Examination. Each sample hose selected in accordance with paragraph 4.5.2 shall be visually and dimensionally examined for conformance to the requirements specified herein.

4.7 Test. Each sample hose selected in accordance with paragraph 4.5.3 shall be subjected to the pressure test (see 4.8.7) and storage and flexing test (see 4.8.15).

4.8 Test methods.

4.8.1 High-temperature sample test. Two first article hose samples of each size shall be subjected to the tests specified in 4.8.4. At the conclusion of

this test, one hose sample of each size shall be subjected to the tests specified in 4.8.2, the other sample of each size shall be subjected to the test specified in 4.8.5.

4.8.2 Low-temperature sample test. The sample hose shall be placed in a cold chamber and maintained at a temperature of minus 65°F for a period of 24 hours. After the 24 hour period and with the chamber and the hose at minus 65°F, the hose shall be fully extended and retracted 30 times. The hose shall then be maintained at minus 65°F for an additional 24 hours. Following this exposure and with the chamber and the hose at minus 65°F, the hose shall be fully extended and retracted 20 times. The cycles of expansion to full length and retraction shall not exceed 1 minute. The hose shall then undergo the tests specified in 4.8.10.2. Samples shall be cut from the hose and subjected to the tests specified in 4.8.9, 4.8.10.1, 4.8.11, 4.8.12 and 4.8.13.

4.8.3 Airflow. Airflow tests shall be conducted on full length hose with storage racks. With an internal airflow of not less than 2000 cfm through the size A hose, the air friction loss shall not exceed 0.40 inch of water. With an internal airflow of not less than 500 cfm for the size B hose, the air friction loss shall not exceed 0.70 inch of water. During testing, the hose shall be extended to full length, but shall not be placed under tension. The inlet end of the hose shall be connected to the airflow and static-pressure measuring duct with the outlet of the air duct unrestricted.

4.8.4 High temperature test. Two complete size A hoses and two complete size B hoses shall be separately subjected to a high-temperature test. The hose shall be attached to a source of air which has a minimum temperature of 300°F, and shall be so arranged as to be supported only by the floor of the test space with the complete length of the hose in contact with the floor. The airflow through 12 inch diameter hose shall be approximately 1200 cfm and through the 6 inch diameter hose approximately 400 cfm. The air shall consist of not more than 90 percent recirculated air. The male connection of the duct shall be connected to the source of heated air. The ambient air temperature of the test chamber measured at any point 1 foot from the periphery of the hose shall be 50°F. If air moving devices are used in testing, baffles shall be placed around the hose to prevent air from blowing directly on the hose. Each hose shall be tested for 150 hours. At the end of the 150 hour test, the temperature of the air passing through the hose shall be increased to 350°F and the hose tested at this temperature for a 2 hour period with all other test conditions remaining the same. At the conclusion of the test, the hose shall exhibit no evidence of scorching nor other harmful effects.

4.8.5 Low temperature test. Following the exposure specified in 4.8.4, one complete size A hose, one complete size B hose shall be placed in a cold chamber and maintained at a temperature of minus 65°F for a period of 24 hours. After the 24 hour period with the chamber and the hose at minus 65°F, the hose shall be fully extended and then retracted to storage position 30 times. The hose shall then be maintained at minus 65°F for an additional 24 hour period. Following this exposure and with the chamber and the hose at minus 65°F, the hose shall be fully extended and retracted to storage position 20 times. The flexibility and retractability of the hose shall be observed and recorded. The time required to retract the hose to storage position shall not exceed 1 minute. At the conclusion of this test, the materials shall exhibit no harmful effects due to flexing or exposure. The hose shall then undergo the tests specified in 4.8.6.1 through 4.8.6.3, 4.8.7 and 4.8.8.

4.8.6 Environmental. One size A hose and one size B hose shall be subjected to the following tests in accordance with the specified procedures of MIL-STD-810 and as specified herein. There shall be no serious corrosion of metallic parts or other damage that might affect subsequent operation.

4.8.6.1 Salt spray. The salt spray test shall be conducted in accordance with the specified procedure for a period of 50 hours. (see 4.8.6).

4.8.6.2 Fungus-resistance test. The fungus-resistance test shall be conducted in accordance with the specified procedure (see 4.8.6).

4.8.6.3 Sunshine test. The sunshine test shall be conducted in accordance with the specified procedure for a period of 50 hours (see 4.8.6).

4.8.7 Pressure test. One size A hose and one size B hose shall be subjected to the pressure test. Blank fittings shall be connected to the end connections. One fitting shall have provisions for increasing or decreasing the internal pressure and the other shall have provisions for pressure measurement. The hose shall be fully extended when pressurized. The end connections shall be anchored to maintain at least 90 percent extended hose length when negative pressure is applied. The hose shall withstand internal pressures of a positive 2 inch Hg and a negative 1 inch Hg relative to surrounding atmosphere, without rupture.

4.8.8 Tensile-load test. One size A hose and one size B hose shall be subjected to a tensile-load test. In testing the hose, blanks shall be secured to the end connections and the hose subjected to a tensile load of 250 pounds. All forces shall be applied to the center of the blanks. No rupture or other damage shall occur as a result of this test.

*4.8.9 Fire resistance. Materials shall be tested for fire resistance in accordance with FED-STD-191, method 5904. New material and pieces of hose taken from those tested in the group 1 sequence or under sampling shall be utilized for the fire-resistance test.

4.8.9.1 Fabric samples. Six pieces of fabric 2 3/4 inches by 12 1/2 inches, representing each condition of hose fabric shall be utilized. Where possible, one-half of each set shall be cut with the long dimension in the direction of the warp and the other half with the long dimension in the direction of the fill. Pieces of stitching material or nonmetallic scuff strips shall be 12 1/2 inches long.

4.8.9.2 Flame and char test. The duration of flame and glow in the specimen shall be timed. After complete extinction of all flame and glow, the char length shall be measured. No specimen shall support flame more than 3 seconds or glow more than 5 seconds after the burner is withdrawn. Average char length of any set of test specimens shall not exceed 5 inches. Char length shall be the distance from the exposed end of the specimen in which any portion of the material is destructed or transformed from its normal state into an incoherent, softened or ashlike substance.

4.8.10 Abrasion resistance. Abrasion resistance of the hose fabric and the hose assemblies shall be determined as follows:

*4.8.10.1 Abrasion test. Pieces of new hose fabric and fabric removed from hose which have undergone the Group 1 testing sequence shall be tested in accordance with FED-STD-191, Method 5306. The Taber Abrasor shall employ H-22 abrador wheels under a load of 1000 grams. Tests shall be conducted on the side of the material which would be the external side of the hose. At the end of 1000 wear cycles, the fabric coating shall not be worn to such extent that the basic fabric is torn by the abrador wheels. Magnification shall be used to aid in determining the extent of wear.

4.8.10.2 Drag test. One each size A and size B assembled hose with end connections and built-in storage device shall be attached to the rear of a towing vehicle and dragged at a speed of from 4 to 5 mph over clean, dry, brush finished concrete. (Asphalt, tar, traffic-worn or smooth traveled concrete, or oily surfaces shall not be permissible.) Each hose shall be attached in such a manner that it cannot rotate, and is not suspended above the concrete surface. The hose shall be dragged in the direction of its axis and shall be inspected at approximately 500 foot intervals. After the hose has been dragged 20,000 feet, there shall be no holes in the basic fabric. The scuff strips shall not become detached nor loosened during the test.

*4.8.11 Absorption test. All materials shall be tested for resistance to gasoline, oil and water in accordance with ASTM Standard D471-79. Pieces of hose fabric, scuff strip material, and stitching shall be soaked in 91 octane gasoline, SAE No. 10 engine oil and water. At the end of 48 hours, the material shall be examined to determine that the increase in thickness, weight and volume does not exceed 10, 15 and 22 percent respectively.

*4.8.12 Tensile strength. Breaking strength of non-metallic materials and tear strength of the hose fabric shall be determined by the cut strip and falling pendulum methods, respectively, as specified in FED-STD-191, Methods 5102 and 5132. Pieces of material cut from air ducts that have been subjected to the Group 1 testing sequence shall exhibit at least 75 percent of the strength of the same material when new.

*4.8.13 Fabric flex life. Flex life of the hose fabric shall be tested by subjecting six 1 by 6 inch pieces of each material to 10,000 bend flex cycles in a DeMattia Flexing Machine, or equal, in accordance with ASTM Standard D430-73. If practicable, half of the samples shall be cut in the direction of the warp, and the other half cut in the direction of the fill. The groove described for 1/4 inch thick samples shall not be used. Following the bend flexing, the hose material shall be checked for breaking strength in accordance with 4.8.12 and shall exhibit 75 percent of the strength of unflexed fabric.

4.8.14 Reparability test. When torn or punctured the hose shall be reparable by stitching or cementing of patches. Reparability of the stiffener core shall be determined by flattening samples of size A and size B hose, each 2 feet long, to one-third of their original diameter and then returning the hose to the approximate original shape without the use of special tools.

4.8.15 Storage and flexing test. The hose assembly shall be retracted to the storage position and extended to its full length a sufficient number of cycles to assure that the storage device will not damage the fabric and that the hook and catch will secure and retain the hose in a retracted storage

position. With the hose in a fully extended position and one end secured to an air source, the hose shall be capable of bending 90 degrees in any direction without restricting the airflow. The hose shall be readily returned to the storage position by the effort of one man using only his hands.

*4.9 Examination for packaging. The preservation, packaging, packing and marking shall be examined for conformance with section 5.

*5. PACKAGING

5.1 Preservation and packaging. Preservation and packing shall be level A or commercial.

5.1.1 Level A.

*5.1.1.1 Unit packaging. Hose shall be preserved in accordance with MIL-P-116, method III. Prior to packaging, hose assemblies shall be retracted and secured in the storage position as specified in 3.2.1. The hose shall be packaged in containers conforming to PPP-B-665.

*5.1.2 Commercial. The commercial preservation of the hose assemblies be in accordance with the requirements of ASTM-D-3951.

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

*5.2.1 Level A. Each hose assembly, packaged as specified in 5.1.1.1, shall be packed in overseas type shipping containers conforming to PPP-B-576, PPP-B-585, PPP-B-591, PPP-B-601, and PPP-B-621. When specified (see 6.2), shipping containers shall be provided with caseliners conforming to MIL-L-10547. Caseliners shall be closed and sealed in accordance with the appendix to MIL-L-10547. Caseliners for fiberboard boxes will not be required. The fiberboard boxes shall be waterproof sealed with tape in accordance with the appendix to the container specification. Shipping containers shall be closed and strapped in accordance with the appendix to the applicable box specification. The gross weight of wood or wood-cleated boxes, shall not exceed 200 pounds. Fiberboard boxes shall not exceed the weight limitations of the applicable box specification.

5.2.2 Level B. The hose assemblies, packaged as specified in 5.1.1.1, shall be packed as specified in 5.2.1 except the containers shall be domestic type. Box closures and sealing shall be in accordance with the appendix to the applicable box specification. Gross weight shall not exceed the weight limitations of the applicable container specification.

*5.2.3 Commercial. The commercial packing of the hose assembly shall be in accordance with the requirements of ASTM-D-3951.

*5.3 Marking.

*5.3.1 Level A and B. In addition to any special or other identification marking required by contract (see 6.2), interior and exterior containers shall be marked in accordance with MIL-STD-129. The following information shall be included,

*6.4 First article. First article will be required of contractors that have not supplied this item within 24 months prior to solicitation for bids. First article will be required only for the size of hose on contract plus hose fabric, scuff strip and stitching materials. Approval of the first article samples authorizes the commencement of production but does not relieve the contractor of the responsibility for compliance with all the applicable provisions of this specification. Any changes or deviations from the first article method during production runs shall be subject to approval by the contracting officer.

*6.5 Changes from previous issue. The margins of this specification are marked with asterisks (or vertical lines) 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.

Custodians:
Navy - MC
Air Force - 99

Preparing activity:
Air Force - 82

Review activities:
Army - AT, MD, ME, GL
DLA -CS

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