

MIL-H-6399B
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 SUPPLSSEDING
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MILITARY SPECIFICATION

HOSE, RUBBER, WIRE-WOUND, SYNTHETIC, ICE ELIMINATING SYSTEM

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

1. SCOPE

1.1 This specification covers one type of lightweight, nonkink flexible hose fabricated of synthetic rubber.

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS

Military

MIL-H-775	Hose, Rubber, Plastic, Fabric, Or Metal (Including Tubing); And Fittings, Nozzles And Strainers, Packaging Of
MIL-L-6082	Lubricating Oil; Aircraft Reciprocating Engine (Piston)
MIL-C-6985	Clamp, Hose

STANDARDS

Federal

Fed. Test Method	
Std. No. 601	Rubber: Sampling And Testing

Military

MIL-STD-129	Marking For Shipment And Storage
MIL-STD-831	Test Reports, Preparation Of
MS33658	Fitting End, Hose Connection, Standard Dimensions For

PUBLICATIONS

Air Force-Navy Aeronautical Bulletin

ANA 438	Age Controls Of Age-Sensitive Elastomeric Items
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(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.)

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- * 2.2 Other publications. The following document forms a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

CATALOGING HANDBOOK

H4-2 Federal Supply Code For Manufacturers (United States And Canada) - Code To Name

(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington DC 20402.)

3. REQUIREMENTS

- * 3.1 First article. The supplier shall furnish hose samples and test reports (see 4.4.2) within the time frame specified (see 6.2), to the procuring activity to prove, prior to starting production, that his production methods and choice of design will produce hose that comply with the requirements of this specification. Approval of first article samples will not relieve the supplier of his obligation to furnish hose conforming to the applicable provisions of this specification. Any changes or deviations of production hose from the approved first article sample during production will be subject to approval by the contracting officer.
- 3.2 Materials. The hose shall be uniform in quality and free from defects in material. Materials shall conform to applicable specifications and to the requirements specified herein. All materials which are not specifically described herein shall be of highest quality and suitable for the purpose intended.
- * 3.3 Design. Hose covered by this specification shall be suitable for use with air-operated aircraft ice-preventive systems. The hose shall be constructed in such a manner as to permit ready assembly with hose fitting connection ends and hose clamps conforming to MS33658 and MIL-C-6985. Any design which renders servicing, adjustment, or replacement unduly difficult under field conditions will not be acceptable.
- 3.4 Construction. The hose shall consist of a seamless synthetic rubber inner tube, spirally wound wire reinforcement and synthetic rubber cover.
 - 3.4.1 Inner tube. The tube of the hose shall be a continuous extrusion of suitable synthetic rubber compounded with the necessary ingredients to meet the requirements of this specification. The bore shall be clean and free from pitting in accordance with the best manufacturing practice.
 - 3.4.2 Wire reinforcement. The reinforcing wire shall be of corrosion resistant steel and having a pitch of not more than 30 degrees.
 - 3.4.3 Cover. The cover shall be of a sunlight-resistant chloroprene polymer and shall be sufficiently smooth to insure an airtight seal when the hose is inserted into a grommet having an inside diameter equal to the minimum hose outside diameter as listed in Table I.

TABLE I

Physical Properties

Nominal inside diameter (inch)	Outside diameter (inch)	Weight lb/ft (maximum)	Flexibility weight in pounds (maximum)
3/8	5/8	0.140	0.75
1/2	3/4	0.170	1.00
5/8	7/8	0.210	1.25
3/4	1	0.250	1.75
1	1-1/4	0.335	2.50
1-1/4	1-1/2	0.420	3.75

3.5 Size.

3.5.1 Inside and outside diameter. The inside and outside diameter of the hose shall be as specified in Table I. A tolerance of $\pm 1/32$ inch will be allowed on the inside diameter and a tolerance of $\pm 1/16$ inch will be allowed on the outside diameter.

3.5.2 Length. Unless otherwise specified by the procuring agency (see 6.2), the hose shall be furnished in 6 foot ± 1 inch lengths. All ends shall be squarely cut.

- * 3.6 Flexibility. The original hose shall bend so that the end, weighted as required in Table I, shall bend at least 90 degrees when tested as specified in 4.6.2.

3.7 Weight. The weight of the hose shall be in accordance with Table I.

- * 3.8 Burst pressure. The burst pressure, after air aging and oil immersion shall be not less than 50 pounds per square inch (psi) for all sizes (see 4.6.3).
- * 3.9 Proof pressure. The hose shall not leak at a proof pressure of 50 psi (see 4.6.3).
- * 3.10 Adhesion. The adhesion between the tube and cover after air aging and oil immersion, shall be not less than 10 psi (see 4.6.1).
- * 3.11 Collapse resistance. When tested in accordance with 4.6.4, the outside diameter of the hose shall not decrease more than 15 percent nor shall there be any signs of cracking.
- * 3.12 Crush resistance. The 1/2-inch, 3/8-inch, 5/8-inch, and 3/4-inch inside diameter hose after air aging and oil immersion shall be capable of supporting 75 pounds distributed evenly over a 4-inch length without more than 10 percent permanent decrease in outside diameter; the 1-inch and 1-1/4-inch inside diameter hose shall be capable of supporting 40 pounds under the same conditions (see 4.6.5).

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3.13 Low temperature. The hose shall be capable of being bent 180 degrees around a mandrel having a diameter equal to ten times the outside diameter of the hose at a temperature of -40 Fahrenheit (F) (-40° Centigrade (C)) without cracking or other signs of failure.

- * 3.14 Sunlight resistance. After 50 hours accelerated weathering, the cover of the hose shall show no signs of cracking or checking. The tensile strength shall be not less than 95 percent of the original tensile strength, but in no case less than 1,250 psi. The percent ultimate elongation of the weathered sample shall not be less than 80 percent of the percent ultimate elongation of an original sample and in no case shall the percent ultimate elongation be less than 250 percent (see 4.6.7).
- * 3.15 Identification of product. The hose shall be marked in white with the specification number, size, date of manufacture in quarter of year and year, and a code in accordance with Department of Defense Cataloging Handbook H4-2. The marking shall be repeated every 12 inches or less along the entire length of the hose (see 4.6.8).
- * 3.15.1 Use of MIL designation. The MIL designation (identification) shall not be used on any product in a lot until the sampling tests have been successfully passed for that lot.
- * 3.16 Age. Age requirements shall be as specified in ANA BUL 438.
- * 3.17 Workmanship. Workmanship shall be of the quality necessary to produce hose free from all defects which affect proper functioning in service.

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 prescribed requirements.
- * 4.1.1 Component and material inspection. The supplier is responsible for insuring that components and materials are manufactured, examined and tested in accordance with referenced specifications and standards.
- * 4.2 Test conditions. Unless otherwise specified for the particular test, all tests shall be accomplished in accordance with FED-STD-601. The burst pressure specimens shall be at least 12 inches long. Where adhesion is specified, the test specimens shall be prepared from the center portion of a 3-inch length of hose.
- * 4.2.1 Preparation of specimen. A 10-foot sample of each inside diameter shall be measured, weighed, and cut into six 1-foot lengths, and two 6-inch lengths. One 1-foot length shall be used for the flexibility test. Two 1-foot lengths and one 6-inch length shall be subjected to air aging for 7 days at a temperature of 158° ±2°F (70° ±1°C). Two 1-foot lengths and one 6-inch length shall

be subjected to oil aging in aircraft lubricating oil, grade 1100, conforming to MIL-L-6082, for 7 days at $150^{\circ} \pm 2^{\circ}\text{F}$ ($70^{\circ} \pm 1^{\circ}\text{C}$). After air aging and oil aging, the two 6-inch lengths shall be used for adhesion tests. One oil-aged and one air-aged length shall be used for burst tests. The remaining oil-aged length and the remaining air-aged length shall be used for collapse, low temperature, proof pressure, and crush tests in the order listed. All tests shall be conducted not less than one hour nor more than four hours after removal from the testing media.

- * 4.3 Classification of tests. The inspection of hose shall be classified as follows:
 - a. First article inspection (see 4.4).
 - b. Quality conformance inspection (see 4.5).
- * 4.4 First article inspection. The first article samples shall be subjected to all examinations and tests specified in this specification.
 - 4.4.1 Test samples. Unless otherwise specified, the contractor shall prepare specimens as outlined in 4.2.1.
 - 4.4.2 Test data. Upon completion of the first article inspection, the contractor shall prepare a test report in accordance with MIL-STD-831 and furnish the report with the test samples to the procuring activity for approval (see 3.1).
- * 4.5 Quality conformance inspection. A 10-foot sample of each inside diameter shall be selected at random from each lot of 6000 feet or fraction thereof and prepared as specified in 4.2.1. Failure of any sample to pass all the tests specified in this specification shall be sufficient cause for rejection of the entire lot.
- 4.6 Tests.
 - * 4.6.1 Adhesion. Adhesion specimens shall be prepared as described in FED-STD-601. Where immersion is specified, a section of the hose approximately 4 inches long shall be immersed and the test specimens prepared from the center portion of this section after immersion (see 3.10).
 - * 4.6.2 Flexibility. A mandrel, equal to the inside diameter of the hose, shall be mounted vertically in a vise, and the hose shall be pushed over the mandrel 2 inches. The weight specified in Table I shall then be attached to the opposite end (see 3.6).
 - * 4.6.3 Burst and proof pressure. The air-aged and oil-aged samples of hose shall be fitted onto standard hose nipples in accordance with MS33658 and clamped with hose clamps conforming to MIL-C-6985. The clamps shall be tightened with 25-inch-pounds torque, the hose filled with water, and the pressure applied. There shall be no leaks or failures at a minimum of 50 psi (see 3.8).
 - * 4.6.4 Collapse resistance. Both air aged and oil aged samples shall be tested by bending 180 degrees around a mandrel having a diameter of five times the outside diameter of the hose. The outside diameter of the hose shall be measured while the hose is bent and the hose shall be examined visually for cracks.

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- * 4.6.5 Crush resistance. Crush test specimens shall consist of a section of hose approximately 6 inches long of the air-aged samples. The 1/2-inch, 3/8-inch, 5/8-inch, and 3/4-inch inside diameter hose shall be subjected to a load of 75 pounds applied normally to the longitudinal axis of the hose over the 4-inch center portion of the specimen; a load of 40 pounds shall be applied to the 1-inch and 1-1/4-inch inside diameter hose specimens in the same manner. The decrease in outside diameter shall be measured 10 minutes after the load is removed (see 3.12).
- 4.6.6 Low temperature. The oil-aged and air-aged samples shall be subjected to $-41^{\circ} \pm 1^{\circ}\text{F}$ ($-41^{\circ} \pm 1^{\circ}\text{C}$) for 24 hours, and then while at that temperature it shall be bent 180 degrees around a mandrel having a diameter of 10 times the outside diameter of the hose. After this test, the hose shall be immersed in water and 50-psi air pressure applied for 1 minute. Any cracking or leakage shall not be acceptable.
- * 4.6.7 Sunlight resistance. Samples of cover stock 1 inch by 6 inches shall be elongated 20 percent and exposed in the following testing device, or equal, for 50 hours (see 3.14).

National Carbon Company Model XIA, Weathering Device, using "Sunshine" carbons, no filters, and 20 minutes' water spray on a 2-hour cycle.

Samples shall be examined for cracking or checking, released, and tensile specimens prepared and tested immediately.

- * 4.6.8 Examination of product. All hose shall be carefully examined in order to insure conformance to the requirements of this specification with respect to materials, workmanship, size, construction, and marking (see 3.16).
- 4.7 Rejection and retest. Rejected hose shall not be resubmitted for inspection without furnishing full particulars concerning previous rejection and measures taken to overcome the defects.
- 4.8 Inspection of preparation for delivery. The preservation, packaging, packing and marking of the hose shall be inspected to determine conformance with the applicable requirements of Section 5 of this specification.

5. PREPARATION FOR DELIVERY

- * 5.1 Preservation and packaging. Preservation and packaging shall be Level A or C as specified (see 6.2).
- * 5.1.1 Level A. Hose shall be preserved and packaged in accordance with applicable level A requirements of MIL-H-775.
- * 5.1.2 Level C. Preservation and packaging shall afford adequate protection against deterioration and physical damage during shipment from supply source to the first receiving activity for immediate use. This level may conform to the supplier's commercial practice provided the latter meets the requirements of this level.
- * 5.2 Packing. Packing shall be level A, B, or C as specified (see 6.2).
- * 5.2.1 Level A. Hose shall be packed in accordance with applicable level A requirements of MIL-H-775.

- * 5.2.2 Level B. Hose shall be packed in accordance with applicable level B requirements of MIL-H-775.
- * 5.2.3 Level C. Packing shall afford adequate protection at the lowest rate against damage during direct shipment from the supply source to the first receiving activity for immediate use. Containers shall conform to applicable carrier rules and regulations applicable to the mode of transportation.
- * 5.3 Marking and labeling.
- * 5.3.1 Packages. Each interior package shall be durably and legibly marked with the following information in such a manner that the markings will not become damaged when the packages are opened:

HOSE, RUBBER, WIRE-WOUND, SYNTHETIC, ICE ELIMINATING SYSTEM
 Specification MIL-H-6399
 Size
 Length
 Quantity
 Date of Manufacture (quarter and year)
 Contract or Order No.
 Stock No.
 Manufacturer's Name or Trade-Mark
 Name of Contractor (if different from manufacturer)

- * 5.3.2 Shipping containers. Each shipping container shall be marked in accordance with the requirements applicable to the individual services, as specified in MIL-STD-129.

6. NOTES

6.1 Intended use. The hose covered by this specification is intended for use with air-operated ice preventive systems.

- * 6.2 Ordering data. Procurement documents should specify the following:
 - a. Title, number and date of this specification.
 - b. Nominal inside diameter and length of hose desired, if other than six-foot lengths (see 3.5.2).
 - c. Time frame required for submission of first article sample and test reports.
 - d. Selection of applicable levels of preservation, packaging and packing (see 5.1 and 5.2).
- * 6.3 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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Custodians:

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Preparing Activity:

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SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 119-R004
INSTRUCTIONS		
<p>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.</p>		
SPECIFICATION		
ORGANIZATION		CITY AND STATE
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT \$
MATERIAL PROCURED UNDER A		
<input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT		
1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE? A. GIVE PARAGRAPH NUMBER AND WORDING.		
B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.		
2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID		
3. IS THE SPECIFICATION RESTRICTIVE? <input type="checkbox"/> YES <input type="checkbox"/> NO IF "YES", IN WHAT WAY?		
4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)		
SUBMITTED BY (Printed or typed name and activity)		DATE

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