

L-H-520G  
April 25, 1983  
SUPERSEDING  
L-H-520F  
March 15, 1978

## FEDERAL SPECIFICATION

### HOSE AND HOSE ASSEMBLIES, NON-METALLIC (RUBBER, PLASTIC)

This specification was approved by the Assistant Administrator, Office of Federal Supply and Services, General Services Administration, for the use of all Federal agencies.

#### 1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers hose and hose assemblies made from either plastic or rubber for use in gardening, nurseries or factory grounds maintenance, general purpose rubber hose, and plastic soaker hoses.

##### 1. Classification.

1.2.1 Hose and hose assemblies. Hose and hose assemblies shall be of the following types, classes, grades, sizes, and styles as specified (see 6.2).

Type I - Rubber, yarn-reinforced hose.

Class 1 - 125 pounds per square inch (psi) working pressure.

Class 2 - 200 psi working pressure.

Size 5/8 - 0.625 inch inside diameter (ID).

Size 3/4 - 0.750 inch ID.

Type II - Plastic hose.

Grade A - Yarn-reinforced.

Grade B - Non-reinforced.

Size 1/2 - 0.500 inch ID.

Size 5/8 - 0.625 inch ID.

Size 3/4 - 0.750 inch ID.

1.2.2 Plastic soaker hoses. The plastic soaker hoses shall be of the following type, and styles, as specified (see 6.2).

Type III

Style 1 - Plastic soaker hose with both male and female couplings.

Style 2 - Plastic soaker hose with a female coupling and an end-closure.

FSC 4720

L-H-520G

## 2. APPLICABLE DOCUMENTS

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

### Federal Standards:

- FED-STD-H28 - Screw Threads for Federal Services.
- FED-STD-162 - Hose, Rubber, Visual Inspection Guide For.
- FED-STD-123 - Marking for Shipment (Civil Agencies).

(Activities outside the Federal Government may obtain copies of Federal specifications, standards, and commercial item descriptions as outlined under General Information in the Index of Federal Specifications, Standards and Commercial Item Descriptions. The Index, which includes cumulative bimonthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, US Government Printing Office, Washington, DC 20402.

(Single copies of this specification and other Federal specifications and commercial item descriptions required by activities outside the Federal Government for bidding purposes are available without charge from General Services Administration Business Service centers in Boston, MA; New York, NY; Philadelphia, PA; Washington, DC; Atlanta, GA; Chicago, IL; Kansas City, MO; Fort Worth, TX; Houston, TX; Denver, CO; San Francisco, CA; Los Angeles, CA; and Seattle, WA.

(Federal government activities may obtain copies of Federal standardization documents and the Index of Federal Specifications, Standards, and Commercial Item Descriptions from established distribution points in their agencies.)

### Military Specification:

- MIL-P-775 - Packaging of Hose, Hose Assemblies; Rubber, Plastic, Fabric, or Metal (including Tubing); and Fittings, Nozzles, and Strainers.

### Military Standards.

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

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

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

American Society For Testing and Materials (ASTM):

- D380 - Standard Methods of Testing Rubber Hose.
- D412 - Rubber Properties in Tension.
- D573 - Rubber Deterioration in an Air Oven.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

### 3. REQUIREMENTS

3.1 First article. When specified (see 6.2), the contractor shall furnish a complete hose length or hose assembly for first article inspection and approval (see 4.2.1 and 6.4).

3.2 Materials. Materials used shall be free from defects which would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products are allowed under this specification unless otherwise specified.

3.2.1 Rubber. The basic compound shall be natural rubber, synthetic rubber, or a mixture of natural and synthetic rubber. All rubber tubes and covers shall resist aging.

3.2.2 Plastic. The plastic compound used in the construction of type II, regular hose, and type III, soaker hose, shall be based on resins made by the polymerization of vinyl chloride or copolymerization of vinyl chloride with minor amounts (not over 50 percent) of other unsaturated compounds, suitably plasticized and pigmented.

3.2.3 Yarns. Reinforcement yarns shall be staple or filament yarns, braided, knitted, or spiral wound.

### 3.3 Construction.

3.3.1 Type I. Type I hose shall consist of an all rubber tube and a cover which resists aging and abrasion. Reinforcement shall consist of a braided, knitted or spiral wound cord, for single or double reinforcement.

L-H-520C

3.3.2 Type II. Grade A hose shall consist of a plastic tube, a braid or other yarn type belted radial reinforcement and an opaque cover. Grade B hose shall be a plastic tube and cover fused together so that manual separation is not possible.

3.3.3 Type III. Plastic soaker hose shall have a wall thickness of not less than 0.012 inch. The hose shall consist of two or more contiguous chambers of such a profile to insure the hose will lie flat when in use. Soaker openings shall be uniform in size and evenly distributed along the length of each hose.

3.3.4 Lengths. Unless otherwise specified (see 6.2) hose and hose assemblies shall be furnished in standard commercial 25, 50, 75, and 100 foot lengths, excluding couplings. Plastic soaker hoses shall be furnished in 25 and 50 foot lengths.

3.3.5 Diameters. The ID of the hose shall be as specified for the nominal size (see 1.2.1). The tolerance on hose ID shall be  $\pm 0.031$  inch. The outside diameter (OD) of type I class 2 hose size 5/8 inch shall not be greater than one inch and the OD of size 3/4 inch hose shall not be greater than 1.188 inches.

3.4 Fittings (couplings and end cap). Unless otherwise specified (see 6.2), all hose assemblies shall be furnished with commercial type fittings of brass or die casting of zinc base alloys as hereinafter specified, attached to the ends. Zinc base alloy die castings shall have a corrosion-resisting coating of cadmium, chromium, zinc or chromate, at the option of the manufacturer.

3.4.1 Type I class 1 type II and type III style 1 hose assemblies. Couplings for type I class 2, type II and type III style 1 hose assemblies shall be male on one end and female on the other. The male end of type III style 1 hose assemblies shall be furnished with a removable cap. A suitable washer may be inserted in the female coupling or may be secured to the hose.

3.4.2 Type I class 2 hose assemblies. Couplings for type I class 2 hose assemblies shall be male on one end and female on the other. A rubber washer shall be inserted in the female end or may be secured to the hose. Couplings shall be of machined or cast brass. Couplings shall be short shank secured with a crimped ferrule or shall be internal expansion type. The coupling bore shall be full size offering no restriction to the flow of water.

3.4.3 Type III, style 2. Type II style 2 soaker hose shall have a female coupling and a rubber washer on one end. The other end shall have end-closure fitting accomplished by mechanical means, which shall remain in place. End closure shall be removeable and replaceable without the aid of special tools.

3.5 Threads. Threads on hose fittings shall be the garden hose type described in FED-STD-H28 except that the thread form and number of threads per coupling shall be in accordance with the manufacturer's standard commercial product.

3.6 Physical requirements. Hose shall meet the physical requirements specified in table I. Hose and hose assemblies shall not break or crack when tested in accordance with 4.5.6 at the temperatures specified in table I.

TABLE I. Physical requirements.

Physical requirements	Type I		Type II		Type III	Test paragraph
	Class 1	Class 2	Grade A	Grade B		
Pressures, pounds per square inch (psi):						
Maximum operating	125	200	-	-	-	- - -
Hydrostatic proof test	150	400	150	100	-	4.5.1
Hydrostatic burst test	500	800	300	200	-	4.5.2
(Adhesion between all components)						
Friction, minimum, pounds	6	6	-	-	-	4.5.3
Tensile strength before aging, minimum pounds per square inch:						
Tube	500	500	-	-	-	4.5.4
Cover	500	500	-	-	-	4.5.4
Tensile strength after aging percent minimum:						
Tube	60	60	-	-	-	4.5.5
Cover	60	60	-	-	-	4.5.5
Ultimate elongation before aging, percent minimum:						
Tube	150	150	-	-	-	4.5.4
Cover	150	150	-	-	-	4.5.4
Ultimate elongation after aging, percent minimum:						
Tube	60	60	-	-	-	4.5.5
Cover	60	60	-	-	-	4.5.5
Low Temperature flexibility	-40deg+/-5degF	-40deg+/-5degF	32degF	41degF	32degF	4.5.6

3.7 Coupling, requirements. Couplings shall not leak, slip, or blow off the hose when tested in accordance with 4.5.7.

L-H-520G

3.8 Marking. Hose and hose assemblies shall be permanently and legibly marked by commercial methods to identify the manufacturer.

3.9 Workmanship. The hose shall be free of blisters, buckled plies, cracks, laps, and porosity. Couplings shall be free of cracks, dented surfaces and sharp edges. Uncoupled hose in bulk quantities if specified shall be free from any defects in workmanship and materials which may limit the use for professional lawn and garden work or the function of heavy duty water hose.

#### 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 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements specified herein and in applicable referenced documents.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.2.1).
- b. Quality conformance inspection (see 4.2.2).

4.2.1 First article inspection. The first article inspection shall be performed on one sample hose length or hose assembly when a first article is required (see 3.1, 6.2 and 6.4). This inspection shall include the examination of 4.4 and the tests of 4.5. The first article may be either a first production item or a standard production item from the supplier's current inventory provided the item meets the requirements of the specification and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract.

4.2.2 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.4, the tests of 4.5, and the packaging inspection of 4.6. This inspection shall be performed on the samples selected in accordance with 4.3.

4.3 Sampling. Sampling and inspection procedures shall be in accordance with MIL-STD-105. All hose and hose assemblies of the same type, class, grade, style, length, and size offered for delivery at one time shall be considered a lot for the purpose of inspection. If an inspection lot is rejected, the contractor may rework it to correct the defects, or screen out the defective units, and resubmit for a complete reinspection. Resubmitted

lots shall be reinspected using tightened inspection. If the rejected lot was screened, reinspection shall be limited to the defect causing rejection. If the lot was reprocessed, reinspection shall be performed for all defects. Rejected lots shall be separate from new lots, and shall be clearly identified as reinspected lots.

4.3.1 Sampling for examination. Examination of the hose shall be based on inspection level II and an Acceptable Quality Level (AQL) of 2.5 percent defective for major defects and 4.0 percent defective for minor defects.

4.3.2 Sampling for tests. Tests shall be based on inspection level S-1 and an AQL of 4.0 percent defective.

4.4 Examination. Each of the sample hose lengths selected in accordance with 4.3.1 shall be visually and dimensionally examined to determine conformance with all the requirements of this specification not involving tests. The classification of defects in FED-STD-162 shall be used to determine and evaluate defects through visual inspection.

#### 4.5 Tests.

4.5.1 Hydrostatic proof pressure test. Test types I and II hose assemblies for visual signs of leakage and damage affecting serviceability at the proof pressures specified in table I. Test procedures shall be in accordance with ASTM D380.

4.5.2 Hydrostatic burst test. Test types I and II hose for hydrostatic strength to withstand burst pressures specified in table I. Test procedures shall be in accordance with ASTM D380.

4.5.3 Friction (adhesion test). Test type I hose for friction requirement specified in table I in accordance with ASTM D380.

4.5.4 Tensile strength and elongation, tube and cover, type I hose only. The tensile strength and elongation of test specimens shall be prepared and tested in accordance with ASTM D412 for both original and aging requirements.

4.5.5 Accelerated aging, type I hose only. Specimens of tube and cover shall be aged in accordance with the method described in ASTM D573 for a period of 70 hours at a temperature of 158 deg +/-5 deg Fahrenheit (F) after which they shall be tested in accordance with 4.5.4.

4.5.6 Low-temperature flexibility tests (see 3.6).

4.5.6.1 Types I and II hose. Condition a new specimen of hose at least 24 inches long at the temperature specified in table I for 5 hours. Bend the conditioned sample through 180 deg around a mandrel with an OD of 10 times the ID of the hose within a time period not to exceed 8 seconds. After bending and allowing to return to 70 deg +/-5 deg F, the sample shall be hydrostatically tested at 100 psi for a period of 1 minute. Release the pressure and examine the test specimen for conformance to 3.6. Failure to pass this test shall be cause for rejection.

L-H-520G

4.5.6.2 Type III hose. A hose specimen approximately 18 inches long shall be exposed to a temperature of 32 deg +/-2 deg F for 4 hours in a low temperature cabinet or room. At the end of the exposure period, the hose shall be bent through an arc of 180 deg around 3 +/-1/8 inch diameter mandrel at a uniform rate in approximately 5 seconds. The bending and exposure of the specimen shall take place in the same atmosphere. The specimen shall show no cracking or breaks. Failure to pass this test shall be cause for rejection.

#### 4.5.7 Coupling test, types I and II hose assemblies.

- a. Test specimen. A representative 12-inch length of hose shall be selected and assembled with male and female couplings conforming to this specification. Couplings shall be attached to the 12-inch sample in accordance with the manufacturer's standard practice.
- b. Coupling pull off test. Apply an axial force of 150 pounds (lb) to the coupling of the test specimen. The load shall be applied using a suitable tensile test machine or by application of a dead weight. The load shall be held for a period of 1 minute minimum. Slippage of the coupling in excess of 1/16 inch, complete pull out, or rupture of the hose shall be considered a failure. Following successful completion of the 150 lb loading test, the assembly shall be proof tested at 100 psi for type I class 1 and type II hose assemblies, and at 200 psi for type I class 2 hose assemblies. Any leak, further movement of the coupling or blow out shall be considered a failure. The lot represented by the test specimen shall be rejected (see 3.7).

4.6 Preparation for delivery inspection. An examination shall be made to determine whether the packaging, packing, palletization, and marking comply with the requirements in section 5 of this specification. Sampling shall be in accordance with MIL-STD-105. The lot size shall be the number of shipping containers in the end item inspection lot. The inspection level shall be S-2 with an (AQL of 4.0 defects per hundred units.

### 5. PREPARATION FOR DELIVERY

5.1 Preservation, packing, and palletization. Preservation, packing, and palletization shall be in accordance with the requirements of MIL-P-775 with the level of preservation and level of packing as specified (see 6.2).

#### 5.2 Marking.

5.2.1 Military agencies. Shipments to civil agencies shall be marked in accordance with MIL-STD-129.

5.2.2 Civil agencies. Shipments to civil agencies shall be marked in accordance with FED-STD-123.



## 6. NOTES

6.1 Intended use. The hose and hose assemblies, and soaker hoses covered by the specification are intended for use in the watering and soaking of lawns or gardens and other cleaning tasks that may require water. Type I, class 2 hose and hose assemblies covered by this specification are intended for general purpose use.

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Type, class, grade, and size (as applicable) required (see 1.2).
- c. If first article is required (see 3.1, 4.2.1 and 6.4)
- d. Length required (see 3.3.4).
- e. Coupling other than specified (see 3.4).
- f. Level of preservation and level of packing required (see 5.1).

6.3 Data requirements. When this specification is used in an acquisition which incorporates a Contract Data Requirements List (DD Form 1423), and invokes the provisions of paragraph 7-104.9(n) of the Defense Acquisition Regulations (DAR), the data requirements will be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved DD Form 1423 incorporated into the contract. When the provisions of DAR 7-104.9(n) are not invoked, the data shall be delivered in accordance with the contract requirements.

6.4 First article. When a first article inspection is required, the item will be tested and should be a first production item or it may be a standard production item from the contractor's current inventory as specified in 4.2.1. The first article should consist of one hose or hose assembly. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article.

### MILITARY INTERESTS:

Custodians

Army - ME

Navy - YD

Review activity

DLA - CS

User activity

Navy - CG

### CIVIL AGENCY COORDINATING ACTIVITIES:

GSA-FSS

TVA-TVA

USDA-AFS

### PREPARING ACTIVITY:

Navy - YD

Project No. 4720-0611

Orders for this publication are to be placed with General Services Administration, acting as an agent for the Superintendent of Documents. See section 2 of this specification to obtain extra copies and other documents referenced herein.

NOTICE OF  
VALIDATION

L-H-520G  
NOTICE 1  
5 June 1987

FEDERAL SPECIFICATION

HOSE AND HOSE ASSEMBLIES, NON-METALIC (RUBBER, PLASTIC)

L-H-520-G, dated April 25, 1983, has been reviewed and determined to be valid for use in acquisition.

Custodians:

Army - ME  
Navy - YD

Preparing Activity:

Navy - YD

Review Activity:

DLA - CS

Civil Agency Coordinating Activities:

GSA - FSS  
TVA - TVA  
USDA - AFS

User Activity:

Navy - CG

AMSC

FSC 4720

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

\*-----\*  
 \* INCH-POUND \*  
 \*-----\*  
 L-H-520G  
 AMENDMENT 1  
 10 July 1991

# FEDERAL SPECIFICATION

## HOSE AND HOSE ASSEMBLIES, NON-METALLIC (RUBBER, PLASTIC)

This amendment, which forms a part of Federal Specification L-H-520G, dated April 25, 1983, is approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

PAGE 4

### 3.4.3 Delete and substitute:

"3.4.3 Type III, style 2. Type III style 2 soaker hose shall have a female coupling and a rubber washer on one end. The other end shall have an end-closure fitting accomplished by mechanical means, which shall remain in place, or shall be permanently sealed to form an end closure. The mechanical type end closure shall be removable and replaceable without the aid of special tools."

#### MILITARY INTERESTS:

Custodians

Army - ME

Navy - YD

Review activity

DLA - CS

User activity

Navy - CG

#### CIVIL AGENCY COORDINATING ACTIVITIES:

GSA-FSS

TVA-TVA

USDA-AFS

#### PREPARING ACTIVITY:

Navy - YD

(Project 4720-0003)

FSC 4720

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