

MIL-H-19034B(SH)
11 January 1988
SUPERSEDING
MIL-H-19034A(SHIPS)
21 November 1966
(See 6.5)

MILITARY SPECIFICATION

HOSE, METAL, FLEXIBLE, CORRUGATED CARBON STEEL AND CORROSION RESISTING STEEL TYPES, INTERNAL COMBUSTION ENGINE AIR INTAKE AND EXHAUST APPLICATION (FOR SURFACE SHIPS ONLY)

This specification is approved for use within the Naval Sea Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers flexible corrugated metal hose without couplings for engine air intake and exhaust lines.

1.2 Classification. The exhaust hose shall be of the following types as specified (see 6.2):

- Type I - Carbon steel.
- Type II - Corrosion resisting steel.

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.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, DC 20362-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

MIL-H-19034B(SH)

SPECIFICATIONS

FEDERAL

- QQ-S-698 - Steel, Sheet and Strip, Low-Carbon.
- PPP-B-591 - Boxes, Shipping, Fiberboard, Wood-Cleated.
- PPP-B-601 - Boxes, Wood, Cleated-Plywood.
- PPP-B-636 - Boxes, Shipping, Fiberboard.
- PPP-B-640 - Boxes, Fiberboard, Corrugated, Triple-Wall.
- PPP-B-665 - Boxes: Paperboard, Metal Edged and Components.
- PPP-T-45 - Tape, Gummed, Paper, Reinforced and Plain, for Sealing and Securing.

MILITARY

- MIL-P-116 - Preservation, Methods of.
- MIL-B-121 - Barrier Material, Greaseproofed, Waterproofed, Flexible.
- MIL-C-3955 - Cans, Composite, Spirally Wound.
- MIL-C-5501 - Caps and Plugs, Protective, Dust and Moisture Seal General Specification for.
- MIL-L-10547 - Liners, Case, and Sheet, Overwrap: Water-Vaporproof or Waterproof, Flexible.

STANDARDS

MILITARY

- MIL-STD-129 - Marking for Shipment and Storage.

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

2.2 Other publications. The following documents form 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.

AMERICAN IRON AND STEEL INSTITUTE (AISI)
Steel Products Manual

(Application for copies should be addressed to the American Iron and Steel Institute, 350 Fifth Avenue, New York, NY 10017.)

UNIFORM CLASSIFICATION COMMITTEE AGENT

Uniform Freight Classification Ratings, Rules and Regulations

(Application for copies should be addressed to the Uniform Classification Committee Agent, Tariff Publication Officer, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

MIL-H-19034B(SH)

(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 Materials.

3.1.1 Type I hose. For type I hose the pressure carrier shall be of cold rolled steel in accordance with QQ-S-698.

3.1.2 Type II hose. For type II hose the pressure carrier shall be of corrosion resisting steel, commercial grade 316L of AISI Steel Products Manual.

3.1.3 Recovered materials. Unless otherwise specified herein, all equipment, material, and articles incorporated in the products covered by this specification shall be new and may be fabricated using materials produced from recovered materials to the maximum extent practicable 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 is allowed under this specification unless otherwise specifically specified.

3.2 Construction. The hose shall consist of a helical or annular corrugated pressure carrier. Unless otherwise specified (see 6.2), each length shall be furnished without fittings. The pressure carrier shall be close pitch, one ply construction. The corrugations shall be formed from a continuous steel strip or from welded strips. All welding shall be done by automatic means.

3.3 Length. Unless otherwise specified (see 6.2), the hose shall be furnished in mill run lengths. The maximum length shall be 20 feet and minimum length 8 feet. Fifty percent of the total footage of any one size furnished shall be 15 feet or longer (see 6.2).

3.4 Sizes. The hose shall be of the sizes shown in tables I and II as specified (see 6.2). This size corresponds to the nominal clear inside diameter of the pressure carrier.

MIL-H-19034B(SH)

TABLE I. Flexible corrugated steel hose.

Size (nominal inside diameter)	Outside diameter (maximum)	Wall thickness (minimum)	Center line bend radius ^{1/}	Maximum operating pressure gauge
Inches	Inches	Inch	Inches	Lb/in ²
2	3-1/4	0.024	22	15
2-1/2	4	.024	24	15
3	4-1/2	.028	26	15
3-1/2	5-1/2	.031	27	15
4	6	.033	28	15
5	6-7/8	.037	30	15
6	7-3/4	.054	32	15
8	9-3/4	.054	38	15
10	12	.054	42	5
12	14-5/8	.059	46	5
14	16-3/8	.059	50	5
16	18-5/8	.059	56	5

^{1/} Hose shall withstand the designed pressure and shall operate in accordance with the requirements specified herein when bent to this radius (see 4.5).

TABLE II. Flexible corrugated corrosion-resisting steel hose.

Size (nominal inside diameter)	Outside diameter (maximum)	Wall thickness (minimum)	Center line bend radius ^{1/}	Maximum operating pressure gauge
Inches	Inches	Inch	Inches	Lb/in ²
2	3-1/4	0.026	22	15
2-1/2	4	.026	24	15
3	4-1/2	.026	26	15
3-1/2	5-1/2	.033	27	15
4	6	.033	28	15
5	6-7/8	.033	30	15
6	7-3/4	.033	32	8
8	9-3/4	.033	38	8
10	12	.033	42	5
12	14-5/8	.045	46	5
14	16-3/8	.045	50	5
16	18-5/8	.045	56	5

^{1/} Hose shall withstand the designed pressure and shall operate in accordance with the requirements specified herein when bent to this radius (see 4.5).

MIL-H-19034B(SH)

3.5 Physical requirements. The physical requirements of types I and II hose shall be as specified in tables I and II, respectively.

3.6 Marking. Each length of hose shall have a marking tag wired at each end marked with the manufacturer's name or trade mark, the size, type and specification number.

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.

4.2 Quality conformance inspection. Quality conformance inspection shall consist of the examination and test of 4.4 and 4.5.

4.3 Sampling for quality conformance inspection.

4.3.1 Lot. All hose of the same size and type presented for delivery at the same time shall be considered a lot for the purpose of examination and tests.

4.3.2 Sampling for visual and dimensional examination and tightness tests. A random sample of hose lengths shall be selected from each lot in accordance with table III for examination and tests as specified in 4.4 and 4.5. If any sample fails the examination and tests, the entire lot shall be subject to rejection.

TABLE III. Sampling for examination and tightness tests.

Lot size	Number of sample hose lengths
8 or less	7
9 to 25	10
26 to 65	15
66 to 180	25
181 and over	35

MIL-H-19034B(SH)

4.4 Visual and dimensional examination. Each sample length of hose selected in accordance with table III shall be visually and dimensionally examined to verify conformance to this specification.

4.5 Tightness test. Each sample length of hose selected in accordance with table III shall be subjected to an air pressure test of 5 pounds per square inch. While under this pressure the hose shall not leak or show any other signs of weakness while the sample length of hose is submerged under a petroleum based oil of a grade not heavier than SAE-10.

4.5.1 Cleaning. Following the tightness test the sample hoses shall be thoroughly cleaned to remove all traces of the test fluid.

4.6 Inspection of packaging. Sample packages and packs, and the inspection of the preservation-packaging, packing and marking for shipment and storage shall be in accordance with the requirements of section 5 and the documents specified therein.

5. PACKAGING

(The packaging requirements specified herein apply only for direct Government acquisition. For the extent of applicability of the packaging requirements of referenced documents listed in section 2, see 6.3.)

5.1 Domestic shipment and early equipment installation.

5.1.1 Preservation and packaging. Preservation and packaging which may be the contractor's commercial practice, shall afford adequate protection against corrosion, deterioration and physical damage during shipment from the supply source to the using activity and until early installation.

5.1.2 Packing. Packing shall be accomplished in a manner which will insure acceptance by common carrier at the lowest rate and will afford protection against physical or mechanical damage during direct shipment from the supply source to the using activity for early installation. The shipping containers or method of packing shall conform to the Uniform Freight Classification Ratings, Rules and Regulations or carrier regulations as applicable to the mode of transportation and may conform to the contractor's commercial practice.

5.1.3 Marking. Shipment marking information shall be provided on interior packages and exterior shipping containers in accordance with the contractor's commercial practice. The information shall include nomenclature, National stock number or manufacturer's part number, contract or order number, contractor's name, destination and mechanical operating characteristics or ratings (as applicable).

5.2 Domestic shipment and storage or overseas shipment. The requirements and levels of preservation, packaging, packing and marking for shipment shall be as specified (see 6.2).

5.2.1 The following provides various levels for protection during domestic shipment and storage or overseas shipment, which may be required when procurement is made.

MIL-H-19034B(SH)

5.2.1.1 Preservation and packaging.

5.2.1.1.1 Level A. Flexible metal hose lengths shall be cleaned in accordance with process C-1 of MIL-P-116. When couplings are specified they shall be coated with preservative type P2 of MIL-P-116. Closure of ends shall be by caps or plugs conforming to MIL-C-5501 or by wrapping with barrier material conforming to MIL-B-121. The hose may be coiled to a diameter not less than 1-1/2 times the minimum bend radius, securely tied and individually packaged in either a fiberboard box in accordance with PPP-B-636 or paperboard, metal stayed in accordance with PPP-B-665. When hose cannot be effectively coiled it shall be individually packaged in containers in accordance with MIL-C-3955. Container closure and sealing shall be in accordance with the applicable container specification.

5.2.1.1.2 Level C. Preservation and packaging shall afford adequate protection against corrosion, deterioration and physical damage during shipment from the supply source to the first receiving activity for early installation and may conform to the contractor's commercial practice.

5.2.1.2 Packing.

5.2.1.2.1 Level A. Hose packaged as specified shall be packed in containers conforming to any one of the following specifications at the option of the contractor:

<u>Specification</u>	<u>Classification</u>
PPP-B-591	Class II, weather-resistant
PPP-B-601	Overseas type
PPP-B-636	Weather-resistant
PPP-B-640	Class 2

When required, shipping containers shall have MIL-L-10547 caseliner and shall be closed and sealed in accordance with the appendix of that specification. Caseliners for fiberboard boxes, PPP-B-636 and PPP-B-640, may be omitted provided all center and edge seams and manufacturer's joint are sealed and water-proofed with pressure sensitive tape in accordance with the applicable fiberboard box specification. Shipping containers shall be closed, strapped or banded in accordance with the applicable box specification or appendix thereto. The gross weight of wood, wood-cleated, and triple-wall boxes shall not exceed 250 pounds. Specification PPP-B-636 containers shall not exceed the weight limitations of the specification.

5.2.1.2.2 Level B. Hose packaged as specified shall be packed in containers conforming to any one of the following specifications at the option of the contractor:

<u>Specification</u>	<u>Classification</u>
PPP-B-591	Class I, domestic
PPP-B-601	Domestic
PPP-B-636	Domestic
PPP-B-640	Class 1

MIL-H-19034B(SH)

Shipping containers shall be closed, strapped or banded in accordance with the applicable container specification or appendix thereto, except that fiberboard containers may be sealed with PPP-T-45 tape. The gross weight of wood, wood-cleated and triple-wall containers shall not exceed 250 pounds. Specification PPP-B-636 containers shall not exceed the weight limitations of the specification.

5.3 Marking. In addition to any special marking required by the contract or order (see 6.2), interior packages and exterior shipping containers shall be marked for shipment in accordance with MIL-STD-129 and shall include the mechanical operating characteristics or ratings as applicable. The nomenclature shall be "Hose, Metal, Corrugated Type, I.C. Engine, Intake and Exhaust."

6. NOTES

6.1 Intended use. The hoses covered by this specification are intended for use in engine air intake and exhaust applications.

6.2 Ordering data. Acquisition documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Type required (see 1.2).
- (c) If specific lengths containing end fittings attached are required, the details of such lengths and end fittings shall be specified (see 3.2).
- (d) Length required (see 3.3).
- (e) Size required (see 3.4).
- (f) Preservation, packaging, packing and marking, if other than specified in 5.1 (see 5.2).
- (g) Special marking required (see 5.3).

6.3 Sub-contracted material and parts. The packaging requirements of referenced documents listed in section 2 do not apply when material and parts are acquired by the contractor for incorporation into the equipment and lose their separate identity when the equipment is shipped.

6.4 Subject term (key word) listing.

Pressure carrier
Steel, cold-rolled
Steel, commercial

6.5 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Preparing activity:
Navy - SH
(Project 4720-N039)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER
MIL-H-19034E(SH)

2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION

4. TYPE OF ORGANIZATION (Mark one)

 VENDOR USER MANUFACTURER OTHER (Specify): _____

b. ADDRESS (Street, City, State, ZIP Code)

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER (Last, First, MI) - Optional

b. WORK TELEPHONE NUMBER (Include Area Code) - Optional

c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional

8. DATE OF SUBMISSION (YYMMDD)

(TO DETACH THIS FORM, CUT ALONG THIS LINE.)