

MILITARY SPECIFICATION

HOSE ASSEMBLY, METAL, FLEXIBLE, BREATHING OXYGEN

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

1. SCOPE

1.1 Scope. This specification covers one type of breathing oxygen, flexible metal, hose assembly.

* 1.2 Part numbering. The specification part number is a definitive part number which will be formulated to identify each item covered by this specification. The part number will be formulated by selecting from the requirements options available in this specification as follows:

Hose Assembly, Metallic

Definitive Military Specification

Part Number

M26499

Military Specification Number

XX

Length (see 6.4)

* 2. APPLICABLE DOCUMENTS

* 2.1 Government documents.

* 2.1.1 Specifications and standards. Unless otherwise specified (see 6.2), the following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation, form a part of this specification to the extent specified herein.

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, Texas 78241 by using the self addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 4720

SPECIFICATIONS

FEDERAL

- QQ-B-626 - Brass, Leaded and Nonleaded: Rod, Shapes, Forgings and Flat Products with Finished Edges (Bar and Strip).
- * QQ-C-390 - Copper Alloy Castings (Including Cast Bar).
- QQ-B-654 - Brazing Alloys, Silver.
- PPP-B-601 - Boxes, Wood, Cleated-Plywood.
- PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner.
- PPP-B-636 - Boxes, Shipping, Fiberboard.

MILITARY

- MIL-P-116 - Preservation, Methods of.

STANDARDS

MILITARY

- * MIL-STD-12 - Abbreviations for use on Drawings, Specifications, Standards, and in Technical-Type Publications.
- MIL-STD-105 - Sampling Procedures and Tables for Inspections 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.

(Copies of specifications and standards required by manufacturers 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(s) form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

COMPRESSED GAS ASSOCIATION, INC

Pamphlet V-1 - American Standard Compressed Gas Cylinder Valve Outlet and Inlet Connections.

(Application for copies of CGA Pamphlet No. V-1 may be obtained from the Compressed Gas Association 11 West 42nd Street, New York NY 10036.)

2.2.1 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 Qualification. The hose assembly furnished under this specification shall be a product which has been tested and which has passed the qualification tests herein.

3.2 Components. The hose assembly shall consist of the following major components:

- a. Corrugated hose (see 3.5.1).
- b. Braided metal covering (see 3.5.2).
- c. End connections (see 3.5.3).

3.3 Selection of specifications and standards. Specifications and standards for necessary commodities and services not specifically designated herein shall be selected in accordance with MIL-STD-143.

3.4 Materials. All parts of the hose assembly shall be made of corrosion resistant metal. No materials shall be used that are toxic or give off toxic fumes, deteriorate easily, or are otherwise adversely affected by continued use with high-pressure oxygen, or that are subject to deterioration when exposed to climatic and environmental conditions likely to occur during service usage.

* 3.4.1 Reclaimed materials. Reclaimed materials shall be used to the maximum extent possible without jeopardizing the intended use of the item.

3.5 Design and construction. The design and construction of the hose assembly shall conform to Figure 1. Nominal lengths shall be as specified (see 6.2).

* 3.5.1 Corrugated hose. The flexible pressure carrying hose shall be helically or annularly corrugated from corrosion-resistant, seamless or welded and redrawn steel tubing. The final inside diameter shall be 1/4 inch plus 1/16 inch minus 1/64 inch.

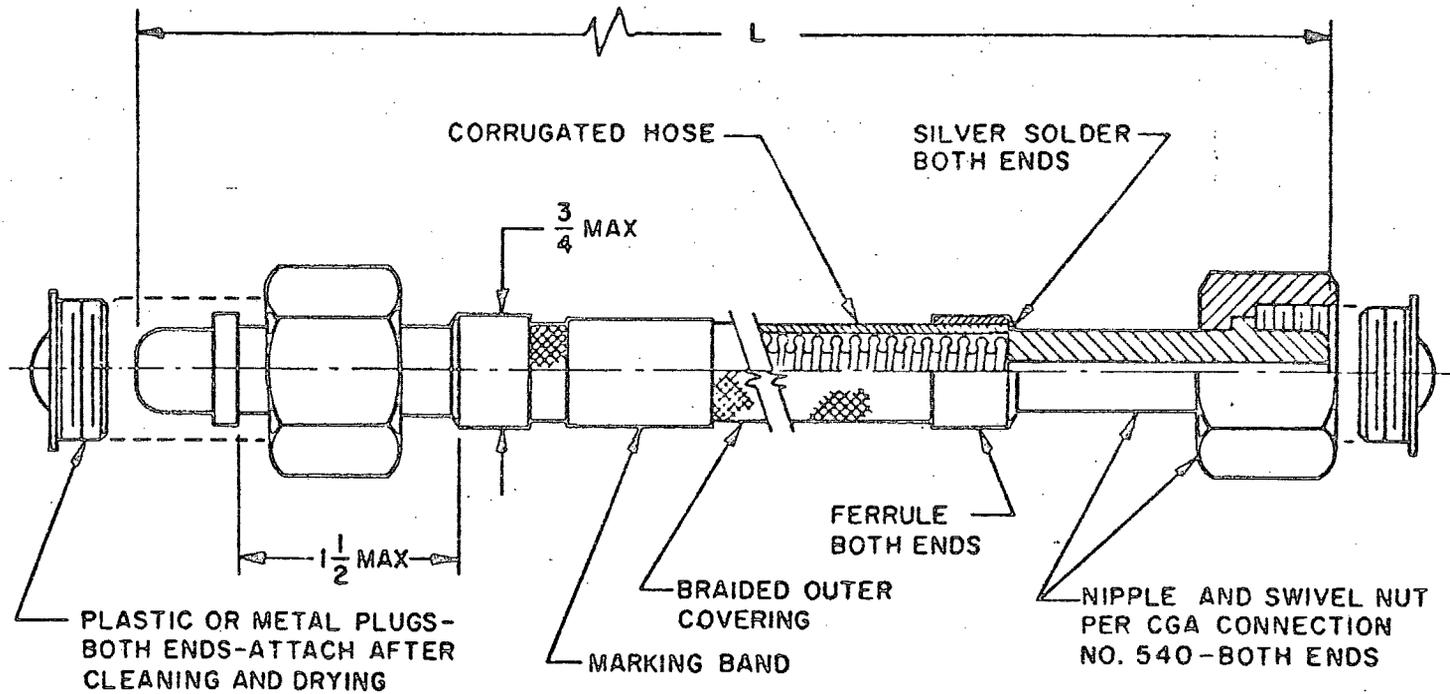
3.5.2 Braided outer covering. The corrugated hose shall be reinforced with one or more layers of corrosion-resistant steel-wire braid.

3.5.3 End connections. A nipple and swivel nut in accordance with pamphlet V-1, Compressed Gas Association connection No. 540 shall be silver soldered onto each end of the hose. The nipple shank length shall not exceed 1 1/2 inches. The nipple and swivel nut shall be made of material conforming to QQ-B-626, composition 22, half-hard or QQ-C-390, composition 2.

3.5.3.1 Ferrules. A hexagonal ferrule, approximately 1/2-inch long and 3/4-inch across the flats, shall be provided at each end of the hose as shown on Figure 1. When held by a wrench, the ferrule shall prevent the twisting of the hose assembly during installation.

3.5.4 Silver soldering. All silver soldering operations shall be accomplished with class 4, 5, or 6 silver solder in accordance with QQ-B-654. The ferrule, corrugated hose, braided outer covering, and nipple shank be silver soldered together at each end of the hose assembly as shown on Figure 1.

3.6 Performance.



NOMINAL LENGTH(L)	TOLERANCE	DASH NO
24	$\pm \frac{1}{4}$ IN	-24
48	$\pm 1\%$	-48
OTHER	$\pm 1\%$	-L

ALL DIMENSIONS IN INCHES

FIGURE 1

3.6.1 Proof pressure. The hose assembly shall be capable of withstanding a proof pressure of 7,000 pounds per square inch gage (psig) without leakage.

* 3.6.2 Low temperature. The hose assembly shall be capable of bending, without damage, 180 degrees around a 4-inch diameter mandrel with the hose assembly stabilized at -65° F.

3.6.3 Vibration. The hose assembly shall be capable of withstanding vibration of 3,600 cycles per minute (cpm) without sign of failure, while the hose assembly is pressurized to proof pressure of 7,000 psig.

3.6.4 Pressure impulse. The hose assembly shall be capable of withstanding 50,000 pressure impulses from 0 to 3,500 to 0 psig without failure.

3.6.5 Hose assembly tensile strength. The hose assembly shall be able to withstand a tensile pull of 1,000 pounds without failure.

3.6.6 Burst pressure. The hose assembly shall not burst or otherwise break at any seam or junction at less than 14,000 psig hydraulic pressure.

3.7 Identification of product. The hose assembly shall be marked for identification in accordance with MIL-STD-130 as specified for parts. The marking shall be made in raised or stamped lettering on a corrosion resistant metal band permanently fastened around the braided outer covering. The following special marking shall also be included on the band:

"MAX WORKING PRESSURE - 3,500 PSIG"

3.8 Workmanship. The hose shall be assembled and finished in a thoroughly workmanlike manner. Particular attention shall be given to freedom from blemishes, defects, burrs, and sharp edges, and to thoroughness of soldering.

3.8.1 Loose, spattered, or excess silver solder, metal chips, flux, and all other foreign material shall be removed prior to final cleaning and drying.

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.

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

- a. Quality assurance tests (see 4.3).
- b. Qualification testing (see 4.6).

4.3 Quality assurance tests. The quality assurance tests shall consist of the following:

- a. Individual tests.
- b. Sampling plans and tests.

4.3.1 Individual tests. Each hose assembly shall be subjected to the following tests as described under 4.5:

- a. Examination of product (see 4.5.2).
- b. Proof pressure (see 4.5.3).

4.3.2 Sampling plans and tests.

4.3.2.1 Sampling plan A. Samples from each lot selected in accordance with MIL-STD-105, Inspection Level II AQL 2.5 percent shall be examined as specified in 4.5.1.

* 4.3.2.2 Sampling plan B. Samples from each lot selected in accordance with MIL-STD-105, Inspection Level S2, AQL 1.0 percent shall be subjected to the following tests in the order listed:

- a. Tensile strength (see 4.5.7).
- b. Burst pressure (see 4.5.8).

4.3.2.3 Rejection and retest. When one or more items from a lot fail to meet the specification requirements, acceptance of all items in the lot shall be withheld until the extent and cause of failure are determined. After corrections have been made, all necessary tests shall be repeated.

4.3.2.4 Individual tests may continue. For production reasons, individual tests may be continued pending the investigation of a sampling tests failure, but final acceptance of the entire lot shall not be made until it is determined that the lot meets all the requirements of the specification.

4.3.3 Defects in items already accepted. The investigation of a test failure could indicate that defects exist in items already accepted. If so, the contractor shall fully advise the procuring activity of all defects likely to be found and methods of correcting them.

4.4 Test conditions.

4.4.1 The test specified in 4.5.1 shall be conducted after the hose has been cut to length, but prior to the soldering of end connections to the corrugated hose.

4.4.2 All other tests shall be performed with the hose assembly completely assembled.

4.5 Test methods.

4.5.1 Dimension inspection. The corrugated hose sample shall be inspected to determine if the hose inside diameter is $1/4$ plus $1/16$ inch minus $1/64$ inch. A corrugated hose sample not within this tolerance shall be cause for rejection of the lot.

4.5.2 Examination of product. The hose assembly shall be inspected to determine compliance with the requirements specified herein with respect to materials, workmanship, and marking. The hose overall length shall be checked against Figure 1 as applicable to the nominal length specified (see 6.2).

4.5.3 Proof pressure test. The hose assembly shall be subjected to a hydrostatic pressure of 7,000 psig for a minimum of 3 and a maximum of 10 minutes. Clean water shall be used as the pressurizing fluid. Evidence of leakage from any part of the hose assembly shall be cause for rejection. Except for hose assemblies selected for the sampling tests or qualification test, satisfactory hose assemblies shall be cleaned, dried, and plugged in accordance with 5.1.1.1 after completion of the proof pressure test.

* 4.5.4 Low temperature test. The hose assembly shall be brought to a stabilized temperature of -65° F. While at -65° F, the hose assembly shall be grasped by the end connections and bent 180 degrees around a 4-inch diameter mandrel, after which the hose assembly shall be inspected for cracks or breaks in any component or junction.

4.5.5 Vibration. The hose assembly shall be subjected to a vibration of 3,600 cpm while pressurized to 7,000 psig. One end of the assembly shall be connected to a fixed object and the other end shall be connected to a moving object having a double amplitude of vibration of at least $1/8$ inch. The end connected to the moving object shall be so mounted that the central axis of the hose end is parallel to the direction of vibration. The hose assembly shall be bent 180 degrees during the entire test and shall be vibrated for at least 4 hours. Any sign of leakage or cracking shall be cause for rejection.

4.5.6 Pressure impulse test. The hose assembly shall be subjected to a pressure impulse cycle from 0 to 3,500 to 0 psig at the rate of approximately 1 cycle per second (cps) for 50,000 impulse cycles. The hose assembly shall be bent 180 degrees during the entire test. Any sign of leakage or cracking shall be cause for rejection.

4.5.7 Tensile strength test. The hose assembly shall be attached by the end connections to the heads of a tensile testing machine and pulled at the rate of approximately 1 inch per minute up to 1,000 pounds pull. Any failure below 1,000 pounds shall be cause for rejection of the lot.

4.5.8 Burst pressure test. The hose assembly shall be hydraulically pressurized from 0 to 14,000 psig in approximately 2 minutes. If any component of the hose assembly bursts or the assembly cracks at any junction, the lot shall be rejected.

4.6 Qualification testing.

* 4.6.1 Qualification test samples. The qualification test samples shall consist of four hose assemblies. Samples shall be identified with the manufacturer's part number and any additional description required by letter of authorization.

4.6.2 Qualification required. Prior to actual procurements, the product which this specification covers shall pass the qualification tests specified herein. If the product is later modified in any way, the modified form shall be subjected to and shall pass the same qualification tests.

4.6.3 Qualification tests. Qualification tests shall be performed by the manufacturer and shall consist of all the tests described under 4.5. Each qualification test sample shall be subjected to the tests in the following order.

- a. Dimension inspection (see 4.5.1).
- b. Examination of product (see 4.5.2).
- c. Proof pressure (see 4.5.3).
- d. Low temperature (see 4.5.4).
- e. Vibration (see 4.5.5).
- f. Pressure impulse (see 4.5.6).
- g. Tensile strength(see 4.5.7).
- h. Burst pressure (see 4.5.8).

4.7 Packaging inspection. Preservation, packaging, packing and marking shall be inspected to determine conformance to the requirements of Section 5 herein.

5. PACKAGING

* 5.1 Packaging requirements. The requirements for packaging shall be in accordance with Level A or C as specified (see 6.2.c).

5.1.1 Level A. Hose assemblies shall be cleaned, preserved, and packaged as follows:

5.1.1.1 Cleaning. Each hose assembly shall be cleaned of all dirt, flux, and foreign matter by flushing with a suitable solvent. All traces of the solvent shall be removed by flushing the hose assembly with a hot inhibited alkaline cleaner, then rinsing with clean water. The hose assembly shall be thoroughly dried by water-pumped air or nitrogen. The ends of the hose assemblies shall then be sealed with noncombustible noncorrosive and nonshredding plastic plugs.

5.1.1.2 Unit packaging. Each hose assembly shall be unit protected without a preservative in accordance with submethod lc-1 of MIL-P-116.

5.1.1.3 Intermediate packaging. Hose assemblies unit packaged as specified in 5.1.1.2 shall be intermediate packaged in class weather-resistant containers conforming to PPP-B-636. Hose assemblies 48 inches or less shall be packaged straight in quantities of 25 each. Hose assemblies over 48 inches shall be packaged 10 each per intermediate package. Intermediate packaging is not required when the quantity of hose assemblies to a single destination is less than the quantity required for one intermediate containers.

5.1.2 Level C. Hose assemblies shall be accorded the minimum preservation and packaging required to insure against deterioration, damage, or contamination from foreign matter during shipment to the initial receiving activity. Methods and materials shall be in accordance with carrier rules and regulations.

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

5.2.1 Level A. Hose assemblies, packaged as specified in 5.1, shall be overpacked in a close-fitting box conforming to PPP-B-601, overseas type, Grade B, style optional or a PPP-B-621, Class 2, style optional. The boxes shall be closed and strapped in accordance with the appendix of the box specification.

5.2.2 Level B. Hose assemblies, packaged as specified in 5.1, shall be overpacked in a close-fitting box conforming to PPP-B-636, class weather-resistant or as specified for level A except that the boxes may be domestic type. Closure and strapping shall be in accordance with the box specification.

5.2.3 Level C. Hose assemblies, packaged as specified in 5.1, shall be overpacked in containers in a manner that will insure safe delivery to destination and meet carrier rules and regulations.

5.3 Marking for shipment and storage. Unit and intermediate packages and exterior shipping containers shall be marked in accordance with MIL-STD-129. The nomenclature shall be:

Hose Assembly, Metal, Flexible, Breathing Oxygen, High Pressure

6. NOTES

6.1 Intended use. The hose assembly covered by this specification is intended for use as a flexible manifolding connection on oxygen ground servicing equipment.

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

- a. Title, number, and date of this specification.
- b. Nominal lengths of hose assemblies required, according to dash numbers shown on Figure 1 (see 3.5).
- c. Levels of preservation and packaging, and packing (see Section 5).

* 6.3 With respect to products requiring qualification, awards will be made only for products which are, at the time set for opening of bids, qualified for inclusion in Qualified Products List (QPL No.) whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is the San Antonio Air Logistics Center, Engineering Division, ATTN: MMEDO, Kelly AFB, Texas 78241, and information pertaining to the qualification or products may be obtained from that activity.

6.4 Length. Length shall be designated as per Table I.

TABLE I

Nominal Length Inches	Tolerance	Dash Number
24	+ 1/4 Inch	-24
48	+ 1 percent	-48
Other	+ 1 percent	/1

/1 Actual length in whole inches.

* 6.5 Changes from previous issue. The margins of this document are marked with asterisks 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 contractor's 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.

Custodian:
Air Force - 99

Preparing activity:
Air Force - 82

Review activity:
DLA - CS

(Project 4720-0619)

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER
MIL-H-26499B(USAF)

2. DOCUMENT TITLE
HOSE ASSEMBLY, METAL, FLEXIBLE, BREATHING OXYGEN

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)

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