MIL-E-2185C(SHIPS)
22 March 1967
SUPERSEDING
MIL-E-2185B(SHIPS)
12 November 1964
(See 6.2)

MILITARY SPECIFICATION

EXTINGUISHER, FIRE, CARBON DIOXIDE (HOSE REEL) SYSTEM (NAVAL SHIPBOARD USE)

1. SCOPE

1.1 *This specification covers fixed fire extinguisher systems of the hose reel type* whereby carbon dioxide (liquefied and stowed in containers) is expelled by local or remote control through a flexible hose and attached nozzle, readily handled to attack spot fires in a given space.

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

FEDERAL

RR-C-901 - Cylinders, Compressed Gas: With Valve or Plug; ICC 3AA.
PPP-B-585 - Boxes, Wood Wirebound.
PPP-B-591 - Boxes, Fiberboard, Wood-Cleated.
PPP-B-601 - Boxes, Wood, Cleated-Plywood.
PPP-B-621 - Boxes, Wood, Nailed And Lock-Corner.
PPP-B-636 - Box, Fiberboard.
PPP-C-650 - Crates, Wood, Open and Covered.

MILITARY

MIL-P-116 - Preservation, Methods of.
MIL-B-121 - Barrier Material, Greaseproofed, Waterproofed, Flexible.
MIL-B-233 - Boxes, Repair Parts.
MIL-T-704 - Treating and Painting of Material.
MIL-S-901 - Shock Tests, H. I. (High-Impact); Shipboard Machinery, Equipment and Systems, Requirements for.
MIL-D-1000/2 - Drawings, Engineering and Associated Lists.
MIL-P-15024 - Plates, Identification-Information and Marking For Identification of Electrical, Electronic and Mechanical Equipment.
MIL-M-15071 - Manuals, Equipment and Systems.
MIL-P-15137 - Provisioning Technical Documentation For Repair Parts for Electrical and Mechanical Equipment (Naval Shipboard Use).
MIL-C-16310 - Cylinder, Compressed Gas (Compressed Air and Carbon Dioxide, Nonshatterable and Nonmagnetic).
MIL-V-17360 - Valves, Cylinder, Gas, Carbon Dioxide Fire Extinguisher.
MIL-T-24107 - Tube, Copper (Seamless).

STANDARDS

FEDERAL

FED-STD-595 - Colors.

MILITARY

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

DRAWINGS

BUREAU OF SHIPS

810-1385943 - Unions, Silver Brazing, WOG, 3000 psi, IPS for UT Inspection.
810-1385941 - Fittings, Silver Brazing, WOG, 3000 psi for UT Inspection.
810-1385867 - Decalcomania for Navy Gas Cylinders.

(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.)

2.2 Other publications. - The following documents form 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.

DEPARTMENT OF COMMERCE

Code of Federal Regulations.

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, D.C. 20404.)

NATIONAL BUREAU OF STANDARDS

Handbook H28 - Screw-Thread Standards for Federal Service.

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington 25, D.C. 20402.)

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, New York (10016.)

(Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

3. REQUIREMENTS

3.1 Design. - The hose reel fire extinguisher system shall be of a design which has passed the tests specified in 4.3 and shall consist essentially of the following components:

(a) Cylinders, carbon dioxide (50-pound charge), one or more as specified (see 6.1).
(b) Cylinder valve.
(c) Discharge head.
(d) Operating gear, individual, for control of discharge from each cylinder - On-off, local or quick opening remote control type.
(e) Flexible discharge loops.
(f) Discharge manifold or equivalent
(g) Piping (tubing) to hose reel.
(h) Hose reel, trunnion type.
(i) Flexible discharge hose.
(j) Discharge assembly (consisting of control valve, discharge nozzle and horn).
(k) Saddles, clamps and bolts for bracketing cylinders.
(l) Supports and/or clamps to retain discharge nozzle assembly.
(m) Auxiliary controls (pull boxes, cable, cable guard pipe, corner pulleys, etc.) for remote control, if required (see 6.1).

3.1.1 Cylinders. - Cylinders shall be in accordance with RR-C-901, type II, class 1 charged with 50 pounds of carbon dioxide (CO_2). Each cylinder shall have affixed thereto a decalcomania conforming to No 7 of 810-1385867. Nonmagnetic cylinders, when specified (see 6.1), shall conform to MIL-C-16310, Size B.

3.1.1.1 Saddle type clamps and bolts for securing the cylinders to the ship's structure shall be furnished. The clamps and bolts shall be capable of withstanding shock tests specified in 4.3.1. Nonmagnetic saddle type clamps and bolts shall be furnished when nonmagnetic cylinders are specified.

3.1.2 Valve (cylinder, pressure seated type). - The cylinder shall conform to class c of MIL-V-17360.

3.1.3 Discharge head. - The discharge head shall be suitable for use with the cylinder valve (see 3.1.2), and shall withstand the test specified in 4.3.1. It shall have a check feature to prevent backflow of CO_2 when connected to a discharge manifold but not mounted on a cylinder valve.

3.1.4 Flexible discharge loops. - The flexible metallic discharge loops shall be 3/8" inside diameter hose and 12-1/2 ± 3/4" long. Loops shall be suitable for 3000 psi working pressure and shall be constructed of non-ferrous material. Loops shall have a union type inlet connection suitable for connection to the discharge head. The outlet end shall be prepared for silver brazing to a fitting conforming to 810-1385941.

3.1.5 Discharge manifold. - The discharge manifold and piping to hose reel shall be of properly sized copper tubing conforming to MIL-T-24107, suitable for 1900 psi working pressure (w.p) and silverbrazing fittings conforming to 810-1385941 and 810-1385943.

3.1.6 Valves (control). - Control of the flow of carbon dioxide from each cylinder to the manifold shall be provided by means of a remote quick-acting valve or a local "on-off" type control device of a type approved by the Command or agency concerned, incorporated with the discharge mechanism. Pressure operation from the discharge manifold is not acceptable.

3.1.7 Hose reel. -

3.1.7.1 The hose reel shall be of the trunnion type, shall have a capacity for 100 feet of hose (see 3.1.8), and shall be suitable for mounting on a bulkhead or deck. The hose reel shall withstand the tests specified in 4.3.1.

3.1.7.2 The hose reel shall be treated, primed and painted in accordance with MIL-T-704. The finish paint shall be red enamel, Color 11105 of FED-STD-595.

3.1.8 Hose (for hose reel). - The hose shall be 1/2" inside diameter. The cover and tube shall be of polymerized chloroprene or a copolymer product of butadiene suitable for use at -40°F. Reinforcement shall be wire braid. Minimum burst pressure shall be 7000 psi. End fittings shall be as follows:

(a) Inlet end - 1" - 11-1/2 American (national) straight pipe thread (NPS), left hand (LH) external and
3/4" - 14 American (national) taper pipe internal thread (NPT).
(b) Outlet end - 3/4" - 14 NPT external thread.

Hose length shall be 50 feet continuous length. Lengths other than 50 feet but not over 100 feet may be furnished. when specifically required (see 6.1).

3.1.9 Nonmagnetic materials. - When nonmagnetic cylinders are specified (see 3.1.1) hose reels and hoses shall be of suitable non-magnetic material having a nonmagnetic permeability of not over 2.0 in the finished form.

3.1.10 Discharge applicator (horn). -

3.1.10.1 An applicator for discharged carbon dioxide shall be provided on the free end of the hose. The applicator assembly shall consist of a quick-acting valve of the cylindrical or spherical plug type or squeeze grip type approved by the Command or agency concerned, a suitably sized discharge orifice, and diffusing horn. The valve, nozzle and horn shall be assembled with a suitable insulating handle to protect the user from the freezing effect of the carbon dioxide. The horn shall be suitably designed for low-velocity discharge of the carbon dioxide, and shall be fitted with properly orificed single or multi-port nozzle and securely attached to the handle. The horn shall be made from tough water-resistant material having a high dielectric strength. The overall length of the horn and valve assembly shall not exceed 46 inches.

3.1.10.2 Horn stowage. - Suitable brackets, clamps, or similar retainers shall be provided for stowage of the discharge horn assembly. The design shall be such that the discharge assembly can be quickly disengaged from the restraints.

3.2 Repair parts and special tools. -

3.2.1 Repair parts. - Onboard repair parts shall consist of the following:

(a) Safety disk and washer . . . . . 100 percent
(b) Seal wires . . . . . 100 percent

(c) Recharge adapter . . . . . One per ship
(d) Pull box glass (if used) . . . . . One per box
(e) Discharge loop . . . . . One per ship
(f) Discharge head . . . . . One per ship
(g) Gaskets (if used) . . . . . 50 percent
(h) One fully charged replacement cylinder shall be furnished for each two cylinders installed in the system, including stowage rack, shall be furnished for each hose reel system.

3.2.2 Special tools. - Normal maintenance of the equipment shall require no specially designed tools.

3.3 Information plates. - Information plates exposed to the weather shall conform to type A or B of MIL-P-15024. The material shall be brass, corrosion-resisting steel or nickel-copper. If brass is used, the plate shall be given a satin chrome finish. The letter filling shall be colored black. Information plates not exposed to the weather shall be type B of plastic material of MIL-P-15024.

3.4 Manuals. - Manuals shall conform to type I of MIL-M-15071.

3.5 Drawings. - Drawings showing overall dimensions, material list and estimated weight shall accompany bids. Drawings in accordance with MIL-D-1000 2 shall be furnished as specified in the contract or order.

3.6 Workmanship. - The workmanship shall be first class in every respect.

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, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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 Examination. - All parts of the system shall be examined to determine conformance with this specification and with the manufacturer's approved drawings (see 3.5).

4.3 Testing. - Equipment furnished in accordance with this specification shall be of a design which has satisfactorily passed the tests specified below.

4.3.1 Shock tests. - The following tests shall be conducted:

(a) An assembly of one cylinder, cylinder valve, discharge head, control device, flexible discharge loop and discharge manifold (Y-connection) secured to the shock machine by the cylinder clamps and bolts specified in 3.1.1.1 shall be subjected to high-impact shock test in accordance with grade A, class I of MIL-S-901. The cylinder shall contain 50 pounds of water and shall be pressurized to 870 pounds per square inch gage (psig) with air or nitrogen for this test.
(b) The hose reel, hose, discharge assembly and horn clamps and supports shall be similarly tested without internal pressure.

4.3.2 Equipment submitted for test which fails to conform to this specification, or indicates any weakness under test, shall be cause for rejection.

4.4 Examination of preparation for delivery.- An examination shall be made to determine that preservation, packaging, packing, and marking requirements of the applicable contract or order are complied with. Defects shall be scored in accordance with the list below. The lot size shall be the number of shipping containers fully prepared for delivery, with the exceptions that containers need not be sealed or closed, nor interior containers or case liners sealed (if applicable). Examination shall be made in two phases; first an interior examination in process of packaging, and second an examination of containers fully prepared for delivery. The sample unit for each of the two phases shall be one container prepared for delivery as set forth above. The inspection level shall be S-2 of MIL-STD-105, with an acceptable quality level (AQL) of 4.0 defects per 100 units.

Examine	Defects
Marking (interior package or container and exterior container as applicable)	Omitted, incorrect, illegible, improper size, location, sequence or method of application.

Examine	Defects
Materials	Component missing, damaged, defective or not as specified.
Workmanship (as applicable)	Inadequate or improper packaging or packing, such as closure of interior packages or containers, closure of case liners or container flaps, taping of seams, corners, and manufacturer's joint, closure of alternate containers; loose strapping or tape banding; inadequate stapling; bulging or distortion of containers.
Contents (interior and exterior container as applicable)	Number per container not as specified.
Weight (exterior container)	Weight per container exceeds maximum specified.
Preservation (as applicable)	Preservation missing, improperly applied or incorrect type.

5. PREPARATION FOR DELIVERY

5.1 Domestic shipment and early material installation. -

5.1.1 Packaging. - Packaging of all components of the fire extinguisher (except repair parts) shall be in accordance with the manufacturer's commercial practice.

5.1.1.1 Repair parts. - Repair parts (onboard and stock) shall be cleaned, preserved, and packaged in accordance with method III of MIL-P-116. Repair parts shall be packaged one item per unit package unless used in sets or in quantities greater than one.

5.1.2 Packing. - All components of the fire extinguisher (except repair parts) shall be packed in a manner to insure carrier acceptance at the lowest rate and safe delivery at destination. Containers shall be in accordance with the Code of Federal Regulations, the *Uniform Freight Classification Rules or regulations* of other carriers as applicable to the mode of transportation.

5.1.2.1 Repair parts. -

5.1.2.1.1 Stock repair parts. - Stock repair parts shall be packed in wood-cleated fiberboard, cleated *plywood, nailed wood, wirebound wood,* corrugated or solid fiberboard boxes conforming to PPP-B-591, PPP-B-601, PPP-B-621, PPP-B-585, and PPP-B-636, respectively. Fiberboard boxes shall conform to the special requirements of the applicable box specification. The gross weight of wood and wood-cleated boxes shall not exceed 200 pounds.

5.1.2.1.2 Onboard repair parts. - Where onboard parts are destined for a ship that is not fitted with bin or drawer type stowage (see 6.1), the onboard parts shall be packed in type M metal boxes conforming to MIL-B-233 and shall be overpacked in shipping containers conforming to PPP-B-621 or PPP-C-650. Where onboard parts are destined for a ship that is fitted with bin or drawer type stowage (see 6.1), onboard repair parts shall be packed in boxes as specified in 5.2.2.2.1. Charged gas cylinders shall be packed for shipment in accordance with RR-C-901.

5.1.2.1.3 Index list of repair parts. - An index list conforming to MIL-P-15137 shall be inserted in each box of repair parts.

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, Federal stock number or manufacturer's part number, contract or order number, contractor's name and destination.

5.2 Domestic shipment and storage or overseas shipment. - The requirements and levels of preservation, packaging, packing and marking for shipment shall be specified by the procuring activity (see 6.1).

5.2.1 Preservation and packaging.-

5.2.1.1 Level A.-

5.2.1.1.1 Preservation and packaging of all mechanical components shall be in accordance with method III of MIL-P-116. Plugs, caps or barrier material conforming to MIL-B-121 shall be used to seal openings to prevent entrance of foreign material.

5.2.2 Packing.-

5.2.2.1 Level A.-

5.2.2.1.1 Unless otherwise specified in the contract or order, the gas cylinders shall be prepared for shipment in accordance with RR-C-901. Disassembled components of the system (except repair parts and tools) shall be packed in cleated plywood, nailed wood, wirebound wood or symbol V fiberboard boxes conforming to PPP-B-601, PPP-B-621, PPP-B-585, and PPP-B-636, respectively. The gross weight of wood and wood-cleated boxes shall not exceed 150 pounds, and fiberboard boxes shall not exceed 70 pounds.

5.2.2.1.2 Repair parts and tools.-

5.2.2.1.2.1 Stock repair parts and tools.- Stock repair parts and tools shall be packed in boxes conforming to PPP-B-591, PPP-B-601, PPP-B-621, or PPP-B-636. Fiberboard boxes shall conform to the special requirements of the applicable box specification. The gross weight of wood and wood-cleated boxes shall not exceed 200 pounds.

5.2.2.1.2.2 Onboard repair parts and tools.- Where onboard repair parts and tools are destined for a ship that is not fitted with bin or drawer type stowage (see 6.1), the onboard repair parts and tools shall be packed in type M metal boxes conforming to MIL-B-233 and shall be overpacked in shipping containers conforming to PPP-B-621 or PPP-C-650. Where onboard repair parts and tools are destined for a ship that is fitted with bin or drawer type stowage (see 6.1), onboard repair parts and tools shall be packed in boxes as specified in 5.2.2.1.1. Charged gas cylinders shall be packed for shipment in accordance with RR-C-901.

5.2.2.1.2.3 Index list of repair parts and tools.- An index list conforming to MIL-P-15137 shall be inserted in each box of repair parts.

5.2.2.2 Level B.-

5.2.2.2.1 Unless otherwise specified in the contract or order, the gas cylinders shall be prepared for shipment in accordance with RR-C-901. Disassembled components of the system shall be packaged in cleated fiberboard, cleated plywood, nailed wood, wirebound wood, corrugated or solid fiberboard boxes conforming to PPP-B-591, PPP-B-601, PPP-B-621, PPP-B-585, and PPP-B-636, respectively. Fiberboard shall conform to the special requirements of the applicable specifications. The gross weight of wood and wood-cleated boxes shall not exceed 200 pounds.

5.2.3 Marking.- In addition to any marking required by the contract or order, all interior packages and exterior shipping containers shall be marked in accordance with MIL-STD-129. Gas cylinders shall be additionally marked as required by the Code of Federal Regulations. Nomenclature shall be the exact nomenclature for the part or item that has been approved under the contract or order.

5.3 Technical publications.-

5.3.1 Manuals shall be packaged in accordance with MIL-M-15071.

6. NOTES

6.1 Ordering data.- Procurement documents should specify the following:

(a) Title, number, and date of this specification.
(b) Control devices required. (see 3.1)
(c) Type (magnetic or nonmagnetic) and capacity of cylinder required (see 3.1.1).
(d) Hose length required (see 3.1.8).
(e) Whether preparation for domestic or overseas shipment is required; if domestic, the type required (see 5.2).
(f) Whether repair parts boxes are required (see 5.1.2.1.2 and 5.2.2.1.2.2).

6.2 CHANGES FROM PREVIOUS ISSUE.- THE EXTENT OF CHANGES (DELETIONS, ADDITIONS, ETC.) PRECLUDE THE ANNOTATION OF THE INDIVIDUAL CHANGES FROM THE PREVIOUS ISSUE OF THIS DOCUMENT.

Preparing activity:
Navy - SH
(Project 4210-N027Sh)

SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 119-R004

INSTRUCTIONS

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 (as indicated on reverse hereof).

SPECIFICATION

ORGANIZATION (Of submitter)

CITY AND STATE

CONTRACT NO.

QUANTITY OF ITEMS PROCURED

DOLLAR AMOUNT

$

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ 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?

☐ YES ☐ 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

DD FORM 1 APR 63 1426 REPLACES NAVSHIPS FORM 4863, WHICH IS OBSOLETE
(NAVSHIPS OV PRT 12-66)

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