

MIL-C-24224B(SH)
18 October 1985
SUPERSEDING
MIL-C-24224A(SHIPS)
27 October 1969
(See 6.4)

MILITARY SPECIFICATION

. CARTRIDGE, GAS PRESSURE, FOR PRESSURIZING DRY CHEMICAL FIRE EXTINGUISHERS

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 the requirements for gas pressure cartridges to be used in cartridge-operated dry chemical fire extinguishers.

1.2 Classification. The cartridges covered by this specification shall be of the following classes and sizes, as specified (see 6.2.1).

- Class 1 - Magnetic
- Class 2 - Nonmagnetic
- Size 1 - 5-1/4 oz. CO₂ capacity (nominal)
- Size 2 - 8-1/4 oz. CO₂ capacity (nominal)

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.

SPECIFICATIONS

FEDERAL

- PPP-B-636 - Boxes, Shipping, Fiberboard.
- PPP-B-640 - Boxes, Fiberboard, Corrugated, Triple-Wall.

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 20613-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 4210

DISTRIBUTION STATEMENT A Approved for public release; distribution unlimited

MIL-C-24224B(SH)

SPECIFICATIONS (Continued)

MILITARY

- MIL-P-116 - Preservation, Methods of.
- MIL-I-17214 - Indicator, Permeability; Low-Mu (Go-No Go).
- MIL-I-24091 - Extinguisher, Fire, Portable, Potassium, Bicarbonate, Dry Chemical, Cartridge Operated Type.

STANDARDS

FEDERAL

- FED-STD-H28 - Screw Thread Standards for Federal Services.
- FED-STD-H28/2 - Unified Inch Screw Threads - UN and UNR Thread Form.

MILITARY

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

2.1.2 Other government document. The following other Government document forms a part of this specification to the extent specified herein. Unless otherwise specified, the issue shall be that in effect on the date of the solicitation.

CODE OF FEDERAL REGULATIONS

Department of Transportation - Title 49 - Transportation.

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

(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 officer.)

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 nongovernment documents which is current on the date of the solicitation.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 3951 - Commercial Packaging.

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

MIL-C-24224B(SH)

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.)

(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

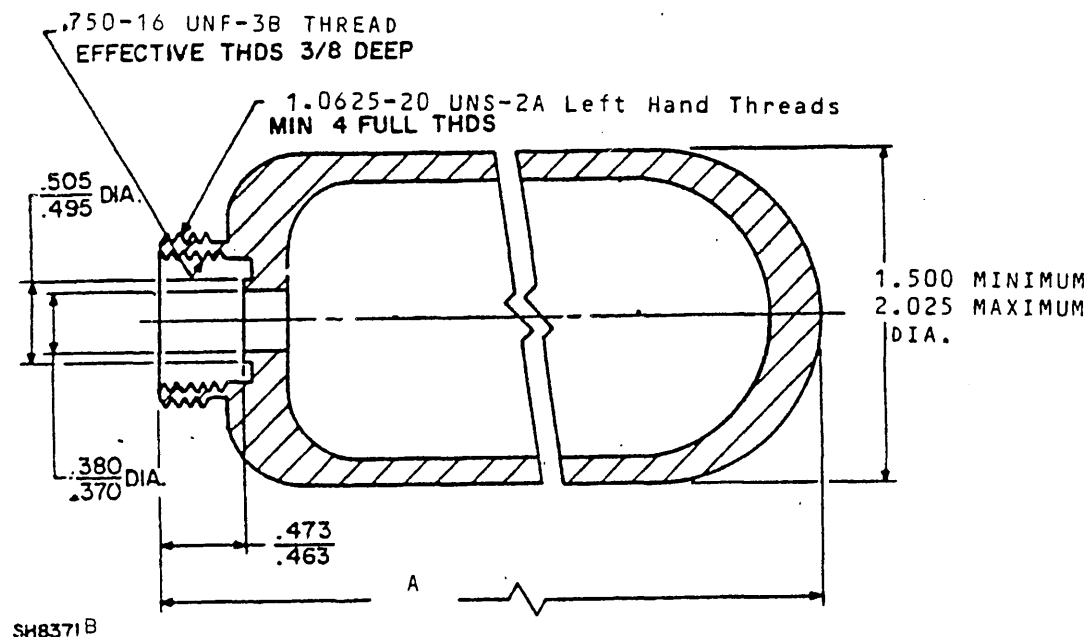
3.1 Material. The use of dissimilar metals in contact, which tends toward electrolytic corrosion (particularly brass, copper, or steel in contact with aluminum alloy), is not acceptable. However, metal plating or metal spraying of dissimilar base metals to provide similar or suitable abutting surfaces is permissible. When class 2 cartridges are specified (see 6.2.1), the average magnetic permeability per unit volume shall not exceed 2.0 when complete with cartridge seal.

3.1.1 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. Gas pressure cartridge shall be constructed to facilitate installation in dry chemical extinguishers conforming to MIL-E-24091. The cartridge shall be of the refillable type, and shall conform to the Department of Transportation (DoT) Specification 3E1800 of title 49 of the Code of Federal Regulations in matters of construction, tests and marking. Critical dimensions shall be as shown on figure 1. The cartridge shall consist of the following parts:

MIL-C-24224B(SH)

Cartridge body.
 Cartridge seal.
 Pressurizing gas, CO₂.
 Shipping cap.



Identification number	Nominal capacity, oz.	A (inches)	
		Min.	Max.
Size 1	5-1/4	6.500	7.750
Size 2	8-1/4	9.500	10.750

FIGURE 1. Critical cartridge dimensions.

3.2.1 Cartridge body. The cartridge body shall be constructed by a process suitable for the intended use. One end shall be necked down or provided with a separate adapter and machined with an external 1.0625-20 UNS-2A-LH thread for attachment to the extinguisher. The neck or adapter shall also have an internal .750-16 UNF-3B thread with a minimum of six threads to receive the cartridge seal. Critical cartridge thread section dimensions shall be as shown on figure 1. Threads shall be in accordance with FED-STD-H28 and FED-STD-H28/2.

3.2.1.1 The external neck thread may be American National Thread Form 1.0625-20 NS-2 left hand thread for gas cartridges having passed first article testing prior to 1 January 1985.

3.2.2 Cartridge seal. The cartridge seal body shall be formed of brass with an external .750-16 UNF-3A thread to fit into the cartridge neck, Each seal assembly shall be furnished as a unit for recharging purposes and shall consist of the body, bushing, seal disc and backup washer.

MIL-C-24224B(SH)

3.2.2.1 Safety seal disc. The seal disc, when installed in the cartridge, shall also serve as a safety disc and shall rupture when subjected to the test of 4.5.3.

3.2.3 Pressurizing gas. The pressurizing gas shall be carbon dioxide with a maximum water content of 0.05 percent by weight.

3.2.4 Capacity. The gas capacity of the cartridge shall be $5\text{-}1/4 \pm 1/4$ oz. for size 1 and $8\text{-}1/4 \pm 1/4$ oz. for size 2, when charged to not more than the maximum filling density permitted in the Code of Federal Regulations, Title 49, Part 173.

3.2.5 Marking. The fully charged weight of each cartridge, the empty weight complete with cartridge seal, and the class and size shall be permanently and conspicuously stamped on each cartridge.

3.2.5.1 Instructions for removing the cartridge and performing periodic inspection shall be printed on the body of each cartridge. The printing shall include "Left-hand thread to remove".

3.2.5.2 The manufacturer's name, DoT number 3E1800, date of manufacture, class and size extinguisher (see MIL-E-24091) for which it was designed shall be printed on the body of the cartridge.

3.2.6 Shipping cap. Each cartridge shall be supplied with a shipping cap of corrosion-resistant material or with a corrosion-resistant finish to protect the cartridge threads. Four equally spaced holes or grooves shall be provided around the edge of the cap to provide venting without significant recoil in the event of rupture of the safety seal. A tag shall be attached to the cap bearing the warning, "Caution - do not remove this cap until ready to install."

3.2.7 Protective coating. Each cartridge shall be degreased, pickled, and bonded before applying organic protective coatings.

3.2.8 Workmanship and materials. Workmanship and materials shall be in accordance with the highest-grade commercial practice covering this class of equipment. The cartridge shall be uniform in quality and shall be free from irregularities, defects, or foreign matter which could adversely affect safety, performance, reliability, or durability.

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.

MIL-C-24224B(SH)

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 of 4.3 and the tests specified in 4.4.

4.2.1 Inspection lot.

4.2.1.1 Cartridges. All cartridges of the same class and size offered for delivery at one time shall be considered a lot for the purpose of quality conformance inspection.

4.2.1.2 Safety seal discs. A lot of safety seal discs shall consist of 100 safety seal discs stamped from the same sheet of material.

4.2.1.3 Certificate of compliance. The contractor shall prepare a certificate of compliance in accordance with the data ordering document (see 6.2.2). The certificate shall state that the contractor has determined (either by actual test, or through adequate control of the manufacturing process) that the extinguisher meets the requirements of section 3. It shall contain actual test, examination, or other verifiable data which verifies conformance to material requirements.

4.2.2 Sampling for examination. Sample cartridges shall be selected at random from each lot in accordance with MIL-STD-105 at inspection level II, for the examination specified in 4.3.

4.2.3 Sampling for quality conformance tests. Sample cartridges shall be selected at random from each lot in accordance with MIL-STD-105, at inspection level I and shall be subjected to the tests specified in 4.4.

4.2.3.1 Sampling for safety seal disc test. One safety seal disc shall be selected from each lot of safety seal discs (see 4.2.1.2) and shall be subjected to the safety seal disc test of 4.5.3. If the safety seal disc fails to conform to this specification the lot represented by the sample shall be rejected.

4.3 Examination. Each of the sample cartridges selected in accordance with 4.2.2 shall be examined to verify compliance with this specification. Examination shall be conducted as specified in table I. If any cartridge is found not in conformance with the requirements of this specification, the cartridge shall be rejected and the lot represented by the sample shall be rejected.

MIL-C-24224B (SH)

TABLE I. Classification of defects.

Categories	Defects
Critical:	None defined.
Major:	
101	Material not as specified.
102	Parts missing, damaged, defective, foreign matter present, irregularities or malfunctioning.
103	Assembly of parts not as specified.
104	Threading not as specified.
105	Protective coating not as specified.
106	Weight not as specified.
107	Dimensions not as specified.
108	Marking not as specified.

4.4 Quality conformance tests. Each of the sample cartridges selected in accordance with 4.2.3 shall be subjected to the tests of 4.5.1 through 4.5.4. If any cartridge fails one or more of the tests, the lot represented by the sample shall be rejected.

4.4.1 Quality conformance inspection report. A quality conformance inspection report shall be repeated by the contractor and provided in accordance with the data ordering document (see 6.2.2).

4.5 Test procedures.

4.5.1 Gas leakage. Each fully charged gas pressure cartridge shall be totally immersed in water conditioned at 115°F for a period of not less than 4 hours and examined for CO₂ leakage. Evidence of leakage shall constitute failure of this test. Gas cartridges shall be thoroughly dried after the test.

4.5.2 Filling weight. Gas cartridge shall be weighed on a scale graduated in 1/8 ounce increments with weights being recorded and checked with full weight stamped on the cartridge. The cartridge seal shall be loosened, allowing the gas pressure to slowly escape. After all CO₂ gas has escaped, the cartridge shall be reweighed to determine the weight of CO₂ gas which has escaped, thereby checking the CO₂ filling against that shown on figure 1.

4.5.3 Safety seal disc. The safety seal disc shall be tested and determined to rupture between 4,050 and 4,500 pounds per square inch (lb/in*), internal pressure.

4.5.4 Magnetic test (class 2). Class 2 cartridges shall be subjected to a "magnetic permeability test using a permeability indicator, low-mu (Go-No-Go) as specified in MIL-I-17214 to determine conformance with 3.1.

4.6 Inspection of packaging. Preservation, packaging, packing) and marking shall be inspected to assure compliance with section 5 of this specification.

MIL-C-24224B(SH)

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 Preservation. Preservation shall be level A, C, or commercial as specified (see 6.2.1).

5.1.1 Level A. Each cartridge shall be preserved and unit packed in accordance with method IC of MIL-P-116. Twenty-five unit packs shall be placed in a fiberboard box in accordance with PPP-B-636, type SF, class weather-resistant, grade W5S, style RSC. Box closure shall be in accordance with method V of the appendix to PPP-B-636.

5.1.2 Level C. Twenty-five cartridges shall be preserved in accordance with method III of MIL-P-116 and packed in fiberboard boxes in accordance with PPP-B-636, class domestic with type, style and grade at the contractor's option. Box closure shall be in accordance with method I of the appendix to the box specification.

5.1.3 Commercial. Twenty-five cartridges shall be preserved in accordance with ASTM D 39510

5.2 Packing. Packing shall be level B, C, or commercial as specified (see 6.2.1).

5.2.1 Level B. Cartridges, packed as specified in 5.1 shall be packed in containers conforming to PPP-B-640, class 2. All center and edge seams and manufacturer's joints are to be sealed and waterproofed with pressure-sensitive tape in accordance with the applicable fiber box specification. Shipping containers shall be closed, strapped, or banded in accordance with the applicable box specification or appendix thereto. The gross weight shall not exceed the weight limitations of the box specification.

5.2.2 Level C. Cartridges, packed as specified in 5.1 shall be packed in containers conforming to PPP-B-640, class 1. Shipping containers shall be closed in accordance with applicable box specification or appendix thereto. The gross weight shall not exceed the weight limitations of the box specification.

5.2.3 Commercial. Cartridges packed as specified in 5.1 shall be in accordance with ASTM D 3951.

5.3 Marking. In addition to any special marking requirements, interior and exterior shipping containers shall be marked in accordance with MIL-STD-129 and shall include hazardous marking as applicable.

MIL-C-24224B(SH)

5.4 Use of loose-fill material.

5.4.1 For commercial preservation and packing. Unless otherwise approved by the contracting activity (see 6.2.1), use of loose-fill material for domestic shipment and early equipment installation and commercial preservation and packing applications such as cushioning, filler and dunnage is prohibited. When approved, unit packages and containers (interior and exterior) shall be marked and labelled as follows:

"CAUTION

Contents cushioned and so forth with loose-fill material.
Not to be taken aboard ship.
Remove and discard loose-fill material before shipboard storage.
If required, recushion with cellulosic material bound fiber,
fiberboard or transparent flexible cellular material."

5.3.2 For level A and C preservation and level B and C packing. Use of loose-fill material is prohibited for level A and C preservation and level B and C packing applications such as cushioning, filler and dunnage.

6. NOTES

6.1 Intended use. The cartridges covered by this specification are intended for use with the 18- or 27-pound dry chemical fire extinguisher specified in MIL-E-24091.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Class required (see 1.2).
- (c) Size required (see 1.2 and figure 1).
- (d) When magnetic permeability will not exceed 2.0 (see 3.1).
- (e) Applicable level of preservation, packing required
(see 5.1 and 5.2).
- (f) Special marking required (see 5.3).
- (g) Approval of the use of polystyrene (see 5.4.1).

6.2.2 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL), incorporated into the contract. When the provisions of DoD FAR Supplement, Part 27, Sub-Part 27.410-6 (DD Form 1423) are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification are cited in the following paragraphs.

MIL-C-24224B(SH)

<u>Paragraph no.</u>	<u>Data requirement title</u>	<u>Applicable DID no.</u>	<u>Option</u>
4.2.1.3	Certificate of compliance	DI-E-2121	----
4.4.1	Quality conformance inspection report	UDI-T-23473	----

(Data item descriptions related to this specification, and identified in section 6 will be approved and listed as such in DoD 5000. 19L., Vol. II, AMSDL. Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

6.2.2.1 The data requirements of 6.2.2 and any task in sections 3, 4, or 5 of this specification required to be performed to meet a data requirement may be waived by the contracting/acquisition activity upon certification by the offeror that identical data were submitted by the offeror and accepted by the Government under a previous contract for identical item acquired to this specification. This does not apply to specific data which may be required for each contract regardless of whether an identical item has been supplied previously (for example, test reports).

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 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 4210-N178)

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge (*DO NOT STAPLE*), and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

NOTE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

(Fold along this line)

(Fold along this line)

DEPARTMENT OF THE NAVY

COMMANDER
NAVAL SEA SYSTEMS COMMAND (SEA 5523)
DEPARTMENT OF THE NAVY
WASHINGTON, DC 20362-5101

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE \$300

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 12503 WASHINGTON D. C.

POSTAGE WILL BE PAID BY THE DEPARTMENT OF THE NAVY

COMMANDER
NAVAL SEA SYSTEMS COMMAND (SEA 5523)
DEPARTMENT OF THE NAVY
WASHINGTON, DC 20362-5101

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

