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SUPERSEDING
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(See 6.8)

MILITARY SPECIFICATION

EXTINGUISHER, FIRE, PORTABLE, POTASSIUM BICARBONATE, DRY CHEMICAL, CARTRIDGE-OPERATED TYPE

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 portable, dry chemical, fire extinguishers of the pressurized gas cartridge-operated type.

1.2 Classification. Fire extinguishers 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 - 18-pound size
Size 2 - 27-pound size

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 55Z3, 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.

AMSC N/A FSC 4210

SPECIFICATIONS

FEDERAL

O-D-1407 - Dry Chemical, Fire Extinguishing, Potassium Bicarbonate.
PPP-B-601 - Boxes, Wood, Cleated-Plywood.
PPP-B-621 - Box, Wood, Nailed and Lock-Corner.
PPP-B-636 - Boxes, Shipping, Fiberboard.
PPP-B-640 - Boxes, Fiberboard, Corrugated, Triple-Wall.

MILITARY

MIL-P-116 - Preservation, Methods of.
MIL-S-901 - Shock Tests, H.I. (High-Impact); Shipboard Machinery, Equipment and Systems, Requirements for.
MIL-L-10547 - Liners, Case and Sheet Overwrap; Water-Vaporproof or Waterproof, Flexible.
MIL-I-17214 - Indicator, Permeability; Low-Mu (Go-No Go).
MIL-C-24224 - Cartridge, Gas Pressure, for Pressurizing Dry Chemical Fire Extinguishers.

STANDARDS

FEDERAL

FED-STD-H28 - Screw-Thread Standards for Federal Services.
FED-STD-H28/2 - Screw-Thread Standards for Federal Services Section 2 Unified Inch Screw Threads - UN and UNR Thread Forms.
FED-STD-313 - Material Safety Data Sheets Preparation and the Submission of.
FED-STD-595 - Colors.

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129 - Marking for Shipment and Storage.
MIL-STD-167-1 - Mechanical Vibrations of Shipboard Equipment (Type I - Environmental and Type II - Internally Excited).

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 issues shall be those in effect on the date of the solicitation.

DEPARTMENT OF TRANSPORTATION (DOT)

Code of Federal Regulations (CFR) 49, 173.306(c) - Shippers, General Requirements for Shipment and Packaging.

(The Code of Federal Regulations (CFR) and the Federal Register (FR) are for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. When indicated, reprints of certain regulations may be obtained from the Federal agency responsible for issuance thereof.)

(Copies of specifications, standards, and other Government documents 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. 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 doucuments which is current on the date of the solicitation.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
B 117 - Standard Method of Salt Spray (Fog) Testing.
(DoD adopted)

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

UNDERWRITERS LABORATORIES, INC. (UL)
Standard Number 299 - Dry Chemical Fire Extinguishers.
Standard Number 711 - Fire Extinguishers, Rating and Fire Testing Of.

(Application for copies should be addressed to the Underwriters Laboratories, Inc., Publications Stock, 333 Pfingsten Road, Northbrook, IL 60062.)

(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 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.3 and 6.3).

3.2 Materials. When class 2 extinguishers are specified (see 6.2.1), material shall be such that the magnetic permeability of the extinguisher assembly and mounting brackets shall be not greater than 2.0.

3.2.1 Aluminum parts. All aluminum parts shall be anodized or otherwise treated to inhibit corrosion.

3.2.2 Finish. The shell and cartridge guard shall be finished with an enamel or powder paint protective coating for identification and enhanced corrosion resistance. The coating shall be color no. 11105 red gloss in accordance with FED-STD-595.

3.2.3 Threads. Threads shall be in accordance with FED-STD-H28 and FED-STD-H28/2.

3.2.4 Fire extinguishing agent. The fire extinguishing agent shall be potassium bicarbonate ($KHCO_3$) dry chemical in accordance with O-D-1407.

3.2.5 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.

3.3 Weight. The weight of the fully charged size 1 extinguisher, excluding its mounting bracket, shall not exceed 40 pounds. The weight of the corresponding bracket shall not exceed 15 pounds. The weight of the fully charged size 2 extinguisher, excluding its mounting, shall not exceed 55 pounds. The weight of the corresponding mounting bracket shall not exceed 15 pounds.

3.4 Overall dimensions. The extinguisher and bracket shall be as small as possible without jeopardizing good design and performance. The overall dimensions of the extinguisher and bracket assembly (with the extinguisher in the bracket) shall not exceed the following:

Size 1		Size 2	
Height:	24 inches	Height:	25 inches
Shell diameter:	12 inches	Shell diameter:	13 inches

3.4.1 Envelope limit. In order to permit the exchange of extinguishers from one mounting bracket to another, no portion of the complete extinguisher, from the base to a height of 12 inches above the base, shall extend beyond the horizontal plane envelope as shown on figure 1.

3.5 Construction.

3.5.1 Extinguisher. The extinguisher shall be a pressurized gas cartridge-operated type. It shall be constructed to permit easy operation, inspection and maintenance. If the extinguisher has a domed end at the base, a foot stand should be permanently affixed to the shell to enable the extinguisher to stand upright on a flat horizontal surface.

3.5.1.1 Rated capacity. The extinguisher shall have a rated capacity of 18 and 27 pounds of potassium bicarbonate for size 1 and size 2, respectively.

3.5.2 Extinguisher components. The extinguisher shall contain the following major components:

(a) Shell
(b) Fill cap
(c) Cartridge receiver assembly
(d) Cartridge, gas pressure
(e) Gas tube
(f) Cartridge guard
(g) Discharge hose
(h) Shut off nozzle
(i) Carrying handle
(j) Mounting bracket
(k) Nozzle holder

3.5.2.1 Shell. The shell (dry chemical chamber) shall be of metallic construction and shall withstand the tests of 4.7.1, 4.7.4 and 4.7.12.2 without leakage or deformation. The rupture strength of the shell shall exceed 1250 pounds per square inch (lb/in^2). The shell shall have a minimum fill opening of 2-1/2 inches in diameter.

3.5.2.2 Fill cap. The fill cap shall be of metallic construction with gasketing, if needed, to provide a seal against pressure loss. The fill cap or shell shall contain a means for relieving the internal pressure in the shell if an attempt is made to remove the fill cap while the shell is pressurized. The fill cap shall contain a minimum of four full threads with a class 1 fit with at least two full threads of the fill cap engaged when pressure relief occurs.

3.5.2.3 Cartridge receiver. The cartridge receiver shall be constructed so that water cannot enter the extinguisher past the puncture pin. Also, the cartridge receiver shall contain a means for relieving the pressure if an attempt is made to remove the gas cartridge while the extinguisher is pressurized. The cartridge receiver shall contain a minimum of four full threads for secure attachment of the pressurized gas cartridge in accordance with MIL-C-24224. With the cartridge attached and the puncturing mechanism activated, the point of the piercing pin shall travel a minimum of 1/4 inch beyond the bottom surface of the cartridge seal disc. The piercing pin shall have a hardened steel finish having a minimum Rockwell 45-N hardness 21.

3.5.2.3.1 Pull-pin and retainer chain. A pull-pin shall be provided to prevent inadvertent operation. The pin shall pass through the cartridge receiver in such a way that the puncture mechanism shall not operate with the pin in place. The pin shall be held captive to the cartridge guard by a short retainer chain (or equivalent), so that it shall not be lost during operation of the unit. A visual mechanical tamper seal shall be used to hold the pull-pin in the safe position. Use of, or tampering with, the extinguisher shall break the seal. The seal shall be field replaceable.

3.5.2.4 Cartridge, gas pressure. A gas pressure cartridge shall be used for providing expellant gas for the extinguisher. The cartridge shall be size 1 (5-1/4 ounces of carbon dioxide) and size 2 (8-1/4 ounces) in accordance with MIL-C-24224 for extinguisher size 1 and 2, respectively. The cartridge shall be class 1 (magnetic) and class 2 (non-magnetic) for extinguisher class 1 and 2, respectively.

3.5.2.5 Gas tube. A gas tube shall be provided to distribute the expellant gas throughout the shell. The gas tube shall be constructed so that no agent shall be able to enter the gas tube. The gas tube shall be securely attached to the shell and the cartridge receiver by screw or welding.

3.5.2.6 Cartridge guard. An easily removable guard shall be provided which completely envelopes the cartridge, protecting it and the cartridge receiver from mechanical damage.

3.5.2.7 Discharge hose. The extinguisher shall contain a flexible discharge hose which shall inhibit gas bubble accumulation under its cover. The ends of the hose shall contain threaded fittings for attachment to the extinguisher and for attachment of a shut-off nozzle. The overall length of the hose and shut-off nozzle assembly shall be approximately 36 inches.

3.5.2.8 Shut-off nozzle. The shut-off nozzle shall be of a squeeze-grip type for one-handed operation by either left- or right-handed personnel even when wearing mittens. The nozzle shall be capable of continuous or intermittent discharge of the agent. The nozzle shall be gastight in the closed position.

3.5.2.9 Carrying handle. A carrying handle, with finger grips for ease in carrying or handling, shall be conveniently located at, or near the top of, the extinguisher. If attached to the shell, the handle shall be pivotally mounted and spring-loaded so that the extinguisher shall be able to return to the position of minimum overall diameter when the handle is released.

3.5.2.10 Mounting bracket. Unless otherwise specified (see 6.2.1), the mounting bracket shall be the quick-opening vehicle type and shall be furnished with the extinguisher. The bracket shall not exceed the specified weights (see 3.3), and shall be constructed to prevent accidental opening, including inadvertent pulling on the opening lever. The bracket, when closed, shall securely hold the extinguisher and shall have no protruding parts which can snag clothing. The bracket shall be easily opened without tools by either left- or right-handed personnel even when wearing mittens. The bracket shall contain a sufficient number of 7/16-inch diameter holes so that it can be bolted to a deck plate or bulkhead and shall provide adequate vibration and shock resistance when subjected to the tests as specified in 4.7.9 and 4.7.10.

3.5.2.11 Nozzle holder. A holster type nozzle shall be attached to the shell.

3.6 Performance.

3.6.1 Temperature range. When charged to the rated capacity with the dry chemical and a pressurized CO_2 gas cartridge as specified in 3.5.2.4, the extinguisher shall operate over a temperature range of from 0 to 120 degrees Fahrenheit (°F).

3.6.1.1 Discharge characteristics at 0°F. When tested as specified in 4.7.2.1, the extinguisher shall discharge a minimum of 85 percent (by weight) of the rated agent capacity. It shall operate with no substantial loss of flexibility in the hose, no freezing of the nozzle parts, and no difficulty in operation of the nozzle. The nozzle shall not be frozen to its holder or clamp while at 0°F.

3.6.1.2 Intermittent discharge characteristics at 0°F. When tested as specified in 4.7.2.2, the agent flow shall start within 1 second of the actuation of the discharge nozzle and shall stop within 1 second of the release of the nozzle handle. A minimum of 80 percent (by weight) of the rated agent capacity shall have been discharged. A minimum of four complete cycles of ON-OFF operation shall be obtained.

3.6.1.3 Discharge characteristics at 70°F. When tested as specified in 4.7.2.3, the extinguisher shall perform as follows:

(a) Size 1. A size 1 extinguisher shall discharge a minimum of 80 percent of the rated agent capacity beyond 19 feet horizontally from the nozzle and have a minimum time of effective discharge of 10 seconds.
(b) Size 2. A size 2 extinguisher shall discharge a minimum of 80 percent of the rated agent capacity beyond 21 feet horizontally from the nozzle and have a minimum time of effective discharge of 11 seconds.

3.6.1.4 Intermittent discharge characteristics at 70°F. When tested as specified in 4.7.2.4, the agent flow shall start within 1 second of the actuation of the discharge nozzle and shall stop within 1 second of the release of the nozzle handle. A minimum of 80 percent (by weight) of the rated agent capacity shall have been discharged. A minimum of four complete cycles of ON-OFF operation shall be obtained.

3.6.1.5 Discharge characteristics at 120°F. When tested as specified in 4.7.2.5, the extinguisher shall discharge a minimum of 85 percent (by weight) of the rated agent capacity.

3.6.1.6 Equivalency. The requirements of 3.6.1.1, 3.6.1.4 and 3.6.1.5 shall be considered to have been met if the extinguisher is listed by Underwriters Laboratories, UL Standard No. 299.

3.6.2 Fire extinguishment. The extinguisher shall extinguish the fire when tested as specified in 4.7.3.1 and 4.7.3.2.

3.6.2.1 Equivalency. The requirements as specified in 3.6.2 shall be considered to have been met if the extinguisher has a minimum fire extinguishing rating by UL of 60-B and 80-B for a size 1 and size 2 extinguisher respectively, when tested in accordance with UL Standard No. 711 using dry chemical in accordance with O-D-1407.

3.6.3 Repeated operation of shut-off nozzle. Operation of the shut-off nozzle as specified in 4.7.5, shall not adversely affect operation of the extinguisher or the shut-off nozzle.

3.6.4 Repeated operation of puncturing mechanism. Operation of the puncturing mechanism on the cartridge receiver as specified in 4.7.6, shall not adversely affect the operation of the extinguisher including the puncturing mechanism.

3.6.5 Repeated operation of extinguisher mounting bracket. The bracket shall be operable after the test as specified in 4.7.7.

3.6.6 Corrosion resistance. The extinguisher and mounting equipment shall be operable after exposure to salt spray atmosphere as specified in 4.7.8.

3.6.6.1 Equivalency. The requirements as specified in 3.6.6 shall be considered to have been met if the extinguisher is listed by UL in accordance with UL Standard No. 299.

3.6.7 Vibration resistance. The extinguisher and mounting bracket shall each be operable after being subjected to the vibrational conditions as specified in 4.7.9.

3.6.8 High-impact shock resistance. The extinguisher and mounting bracket shall pass the high-impact shock test as specified in 4.7.10. Change in design after the shock tests have been conducted shall be cause for retesting unless a specific waiver is granted by the contracting activity. Retention of the nozzle by the nozzle holder is not required.

3.6.9 Drop. The extinguisher shall be operable after being subjected to the drop tests as specified in 4.7.11.

3.6.10 Hydrostatic pressure. The discharge hose and fitting assembly as specified in 3.5.2.7 shall withstand the hydrostatic pressure test of 4.7.12.1.

3.7 Identification.

3.7.1 Identification plates. Three aluminum identification plates with pressure-sensitive adhesive backing shall be securely attached to the extinguisher. The front and back identification plates shall be attached to the extinguisher body and shall contain the manufacturer's name, trademark, and model number of the extinguisher in letters not exceeding 1/4-inch in height. The charging plate shall be attached to the outside front surface of the cartridge guard. The identification plates shall not become detached and the printing shall be legible after the extinguisher has been subjected to all the tests specified herein.

3.7.1.1 Front plate. The front identification plate shall contain legibly printed operating instructions in red lettering at least 1/4-inch in height. The operating instructions shall include the following: "Keep Extinguisher Upright, Pull Ring Pin, Remove Hose, Push On Lever, Squeeze Nozzle, Direct at Base of Flame With Side-to-Side Motion".

3.7.1.2 Rear plate. The rear identification plate shall contain legibly printed recharging and maintenance instructions and shall provide in 1/4-inch high letters the following: "The extinguisher shall be charged with 18 or 27 pounds (as applicable) of potassium bicarbonate dry chemical in accordance with O-D-1407 and the pressurized gas cartridge in accordance with MIL-C-24224 which contains 5-1/4 ± 1/4 or 8-1/4 ± 1/4 (as applicable) ounces of CO_2". It shall also provide the following information:

(a) Specification number.
(b) National stock number, if provided (see 6.2.1).
(c) Allowance parts list number, if provided (see 6.2.1).

3.7.1.3 Charging plate. The charging plate shall provide with lettering at least 1/4-inch in height the following:

Size 1	Size 2
"Use only cartridges containing 5-1/4 ounces of CO_2."	"Use only cartridges containing 8-1/4 ounces of CO_2."

3.7.2 Agent identification band. A band of retro-reflective pressure sensitive tape, purple in color and 2 inches in width shall extend completely around the circumference. The letters "PKP" (an abbreviation for potassium bicarbonate), in white fluorescent lettering 1 inch or 1-1/4 inches high shall be repeated around the band.

3.8 Drawings. When specified in the contract or order, engineering drawings shall be prepared (see 6.2.2).

3.9 Workmanship. Workmanship shall be in accordance with high-grade commercial practice for this equipment. The extinguishers shall be uniform in quality and shall be free from irregularities, defects, or foreign matter which could adversely affect safety, performance, reliability, or durability.

3.10 Material safety data sheet. The contracting activity shall be provided a material safety data sheet (MSDS) at the time of the contract award. The MSDS form and requirements for its preparation are found in FED-STD-313. The MSDS shall be included with each shipment of the material covered by this specification. The MSDS shall list the complete composition of the product, provide available pertinent toxicity information, and delineate acceptable personal protective measures for use when applying the product.

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

(a) First article inspection (see 4.3).
(b) Quality conformance inspection (see 4.4).

4.3 First article inspection. First article inspection shall consist of the examinations and tests as specified in 4.5 and 4.7.

4.3.1 First article test report. When specified in the contract or order, a test report shall be prepared (see 6.2.2).

4.4 Quality conformance inspection. Quality conformance inspection shall consist of the examinations and tests as specified in 4.4.2, 4.5, 4.6, and 4.8.

4.4.1 Inspection lot. For the purpose of quality conformance inspection, those extinguishers of the same class and size offered for delivery at the same time shall be considered a lot.

4.4.2 Sampling for visual examination. Sample extinguishers shall be selected at random from each lot in accordance with MIL-STD-105 at inspection level II, and examined for defects as specified in table I. If any extinguisher is found to be not in accordance with this specification, the lot represented by the sample shall rejected.

TABLE I. Classification of defects.

Categories	Defects
Critical: 1	None defined
Major:	
101	Material not as specified
102	Component missing, damaged, foreign matter present, irregularities, or malfunctioning
103	Assembly of parts not as specified
104	Threading not as specified
105	Finish of exterior surfaces not as specified
106	Weight not as specified
107	Dimensions not as specified
108	Not properly coated or treated to inhibit corrosion
109	Marking for identification not as specified

4.5 Quality conformance examination. Each sample extinguisher shall be examined to verify conformance with the requirements of this specification as specified in 3.2 through 3.5 and as specified in 3.9 (see 4.4.2).

4.6 Quality conformance.

4.6.1 Sampling for quality conformance. Each extinguisher in a lot shall be subjected to the quality conformance tests as specified in 4.7.

4.6.2 Quality conformance inspection report. When specified in the contract or order, a quality conformance inspection report shall be prepared (see 6.2.2).

4.7 Tests. The tests as specified in 4.7.1 through 4.7.13 shall be conducted with the extinguisher filled to the rated capacity with dry chemical as specified in 3.2.5 and charged with a gas cartridge as specified in 3.5.2.4.

4.7.1 Leakage tests.

4.7.1.1 Shell. While pressurized at a minimum pressure of 400 lb/in^2 at approximately 70°F, each sample extinguisher shell shall be submerged in water for a minimum of 60 seconds. Evidence of leakage, or other signs of failure, shall be cause for rejection of that shell.

4.7.1.2 Discharge hose and nozzle.

(a) Discharge hose. While pressurized at a minimum pressure of 400 lb/in^2 at approximately 70°F, each sample discharge hose shall be submerged in water for a minimum of 60 seconds. Evidence of leakage, or other signs of failure, shall be cause for rejection of that discharge hose.

(b) Nozzle. The nozzle shall then be attached to the discharge hose. While pressurized at a minimum of 220 lb/in^2 at approximately 70°F, each sample discharge hose with nozzle shall be submerged in water for a minimum of 60 seconds. Evidence of leakage, or other signs of failure, shall be cause for rejection of that nozzle.

4.7.2 Discharge. The weight of the extinguisher prior to discharge and after discharge shall be measured to determine the weight of agent discharged (after deducting the weight loss of the discharged gas pressure cartridge). For the tests as specified in 4.7.2.1, 4.7.2.2 and 4.7.2.5, the fully charged extinguisher shall be discharged immediately after conditioning at the specified temperature for a period of 24 hours.

4.7.2.1 Discharge at 0°F. The extinguisher shall be held in a normal carrying position and discharged to cessation of agent flow.

4.7.2.2 Intermittent discharge at 0°F. The extinguisher nozzle shall be fully opened for 3 seconds and then released for 5 seconds. This procedure shall be repeated until no additional agent is able to be discharged.

4.7.2.3 Discharge at 70°F. The size 1 extinguisher shall be held in a normal carrying position and discharged indoors to obtain zero wind velocity, with the nozzle held in a horizontal position approximately 36 inches above ground level. The size 2 extinguisher shall be held in a normal carrying position and discharged outdoors under wind conditions of 0 miles per hour (mi/h) wind velocity, with the nozzle held in a horizontal position approximately 36 inches above ground level.

4.7.2.4 Intermittent discharge at 70°F. The extinguisher nozzle shall be fully opened for 3 seconds and then released for 5 seconds. This procedure shall be repeated until no additional agent is able to be discharged.

4.7.2.5 Discharge at 120°F. The extinguisher shall be held in a normal carrying position and discharged to the cessation of agent flow.

4.7.3 Fire extinguishing.

4.7.3.1 Size 1. The test fire for the size 1 extinguisher shall be made in a 150-square foot pan, open at the top with a 5-inch freeboard, positioned at ground level. The pan shall be fueled with not less than 20 gallons of regular, motor vehicle grade gasoline, per 50 square feet of pan, floated on not less than 1 inch of water in the pan and ignited. After 30 seconds preburn, the agent discharge shall be started with the discharge nozzle held about 36 inches above ground level and at a horizontal distance of 12 feet from the

near edge of the test tank. The operator shall move toward the fire, manipulating the discharge nozzle from side to side as necessary to facilitate extinguishment. Fire testing for the size 1 extinguisher shall be conducted indoors or outdoors under weather conditions of 0 to 8 mi/h wind velocity with no measurable precipitation.

4.7.3.2 Size 2. The test fire for the size 2 extinguisher shall be made in a 200-square foot pan, open at the top with a 5-inch freeboard, positioned at ground level. The pan shall be fueled with not less than 20 gallons of regular, motor vehicle grade gasoline, per 50 square feet of pan, floated on not less than 1 inch of water in the pan, and ignited. After 30 seconds preburn, the agent discharge shall be started with the discharge nozzle held about 36 inches above ground level and at a horizontal distance of 12 feet from the near edge of the test tank. The operator shall move toward the fire, manipulating the discharge nozzle from side to side as necessary to facilitate extinguishment. Fire testing for the size 2 extinguisher shall be conducted outdoors under weather conditions of 0 to 8 mi/h wind velocity with no measurable precipitation.

4.7.4 Pressure retention. For this test, a pressure gauge shall be inserted between the discharge outlet in the extinguisher and the inlet to the discharge hose. The pressure loss in the shell shall not exceed 100 lb/in^2 over a period of 7 days after pressurizing the extinguisher with the shut-off nozzle in the closed position and the extinguishers conditioned at 70°F for a minimum of 24 hours.

4.7.5 Operational test of shut-off nozzle. The shut-off nozzle of the extinguisher shall be operated 100 times with the shell unpressurized. Operation of the extinguisher shall be normal on being charged and after completion of this test.

4.7.6 Operational test of puncturing mechanism. The puncturing mechanism on the cartridge receiver shall be operated 100 times with a previously punctured cartridge attached to the cartridge receiver. Fifty of these operations shall be conducted prior to subjecting the extinguisher to the corrosion resistance test as specified in 4.7.8. The additional 50 operations shall be conducted after completion of the corrosion resistance test.

4.7.7 Operational test of extinguisher mounting bracket. The extinguisher shall be locked in the mounting bracket and the bracket shall then be opened. This procedure shall be repeated for 100 cycles.

4.7.8 Corrosion resistance. The extinguisher (see 4.6.2) and cartridge guard, with the shell unpressurized, shall be locked in its mounting bracket and placed upright in a salt spray solution in accordance with ASTM B 117. The hanger hook and attachment shall be similarly tested.

4.7.9 Vibration test. The extinguisher (see 4.6.2), with the cartridge guard in position, shall be locked in the mounting bracket with the bracket securely bolted to a bulkhead plate attached to a vibration table. The extinguisher and bracket assembly shall be subjected to the type I vibrational conditions in accordance with MIL-STD-167-1 for shipboard equipment. The shell shall remain unpressurized during this test.

4.7.10 Shock test. The extinguisher (see 4.6.2), with the gas cartridge pressurized to 100 lb/in^2 with air, and with the cartridge guard in position, shall be locked in the mounting bracket and shall then be subjected to the shock test for grade A, class I, type A, lightweight equipment in accordance with MIL-S-901.

4.7.11 Drop test. The extinguisher (see 4.6.2) with the cartridge guard, but with the shell unpressurized, shall be dropped twice onto a concrete deck with the bottom of the extinguisher 3 feet above the deck. The extinguisher shall be held upright by the carrying handle and allowed to let fall from this position.

4.7.12 Hydrostatic.

4.7.12.1 Hose and fitting. The hose and fitting assembly shall withstand a hydrostatic pressure of 200 lb/in^2 for 5 minutes without damage or leakage after subjection to the following conditions: The hose and fitting assembly shall be maintained at 150°F for 1 week (in air) and then allowed to cool to about 70°F. The hose and fitting assembly shall then be maintained at 0°F for 72 hours, brought back to 70°F and then re-subjected to the hydrostatic pressure test.

4.7.12.2 Shell. The shell shall withstand a hydrostatic pressure of 600 lb/in^2 for 5 minutes as specified in 3.5.2.1.

4.7.13 Magnetic test (class 2). Class 2 extinguishers shall be subjected to a magnetic permeability test using a permeability indicator, low-mu (Go-No Go) in accordance with MIL-I-17214 as specified in 3.2.

4.8 Inspection of packaging. Sample packages and packs, and the inspection of the preservation 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 6.6.)

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

5.1.1 Level A. Fire extinguishers shall be individually unit-protected in accordance with method III of MIL-P-116. Unit containers shall be in accordance with PPP-B-636 class weather resistant type CF or SF with style selection optional to the contractor. Containers shall be closed in accordance with method V of the appendix to the container specification.

5.1.2 Level C. Fire extinguishers shall be individually unit-protected as specified for level A except that the unit containers may be of the domestic class, and closure may conform to method I in accordance with the container specification.

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

5.2.1 Level A. Fire extinguishers preserved as specified in 5.1 shall be packed in wood cleated plywood or nailed wood boxes in accordance with PPP-B-601 overseas type or PPP-B-621 class 2 respectively. Boxes shall be closed and strapped in accordance with the applicable box specification or appendix thereto. The gross weight of the boxes shall not exceed the weight limitations of the applicable box specification.

5.2.1.1 Caseliners. Unless otherwise specified (see 6.2.1), caseliners conforming to and sealed in accordance with MIL-L-10547 shall be required for fire extinguishers preserved at level C (see 5.1.2).

5.2.2 Level B. Fire extinguishers preserved as specified in 5.1 shall be packed in wood cleated plywood, nailed wood, or fiberboard boxes in accordance with PPP-B-601 domestic type, PPP-B-636 class weather resistant, or PPP-B-640 class weather resistant respectively, with box style selection at the option of the contractor. Boxes shall be closed, reinforced, and strapped in accordance with the applicable box specification, with method V closure of PPP-B-636 boxes or with the appendix of the applicable box specification. The gross weight of the boxes shall not exceed the weight limitations of the applicable box specification.

5.2.3 Level C. Fire extinguishers preserved as specified in 5.1 shall be packed in boxes specified for level B except that containers may be of the domestic non-weather resistant type or class and box closure for fiberboard boxes shall be in accordance with method I of the appendix to PPP-B-636.

5.3 Marking. In addition to any special marking required (see 6.2.1), interior packages and exterior shipping containers shall be marked in accordance with MIL-STD-129. Shipments offered for transportation by air shall be labeled in accordance with Department of Transportation regulation 49 CFR part 173.306(c).

5.3.1 Caution tag. If the fire extinguishers covered by this specification are not charged when shipped, a caution tag shall be attached to each fire extinguisher prior to packaging in the unit container with the following information:

"CAUTION

This fire extinguisher is not charged. Follow instructions on the extinguisher for charging."

5.4 Use of loose-fill material.

5.4.1 For domestic shipment and early equipment installation and level C packaging and packing. Unless otherwise approved by the acquisition activity (see 6.2.1), use of loose-fill material for domestic shipment and early equipment installation and in level C packaging 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 with loose-fill material.
Not to be taken aboard ship.
Remove and discard loose-fill material before shipboard storage.
If required, re-cushion with cellulosic material, bound fiber, fiberboard or transparent flexible cellular material."

5.4.2 Level A packaging and level A and B packing. Use of loose-fill material is prohibited for level A packaging and for level A and B packing applications such as cushioning, filler and dunnage.

6. NOTES

6.1 Intended use. The fire extinguishers covered by this specification are intended for use with potassium bicarbonate dry chemical on class B (flammable liquid and grease) and on class C (electrical) fires.

6.1.1 These extinguishers are not designed for use on deep-seated fires of ordinary combustible materials such as wood, paper, textiles, and so forth.

6.1.2 Since unremoved potassium bicarbonate has a corrosive effect on electronic equipment, its use necessitates extensive clean-up. If no threat of a class B fire is apparent, carbon dioxide is the preferred agent for the extinguishing of electrical fires.

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 and size required (see 1.2 and 3.2).
(c) Sample for first article inspection (see 3.1 and 6.3).
(d) If mounting bracket is not required (see 3.5.2.10).
(e) National stock number (NSN) and allowance parts list number (APL), when available (see 3.7.1.2).
(f) Level of preservation and packing (see 5.1 and 5.2).
(g) Preservation, packaging, packing or marking requirements, other than those required (see 5.2 and 5.3).
(h) Approval for use of loose-fill material, when specified (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.

Paragraph no.	Data requirement title	Applicable DID no.	Option
3.8	Drawings, engineering and associated lists	DI-E-7031	Level 3
4.3.1	First article inspection report	DI-T-4902	----
4.6.2	Inspection and test reports	DI-T-5329	----

(Data item descriptions related to this specification, and identified in section 6 will be approved and listed as such in DoD 5010.12L., 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 First article. When a first article inspection is required, the item should be a first article sample or it may be a standard production item from the contractor's current inventory. The first article should consist of one unit. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.4 Material safety data sheets. Contracting officers will identify those activities requiring copies of completed Material Safety Data Sheets prepared in accordance with FED-STD-313. The pertinent Government mailing addresses for submission of data are listed in appendix B of FED-STD-313. In order to obtain the MSDS, FAR clause 52.223-3 must be in the contract.

6.5 Provisioning. Provisioning Technical Documentation (PTD), spare parts, and repair parts should be furnished as specified in the contract.

6.5.1 When ordering spare parts or repair parts for the equipment covered by this specification, the contract should state that such spare parts and repair parts should meet the same requirements and quality assurance provisions as the parts used in the manufacture of the equipment. Packaging for such parts should also be specified.

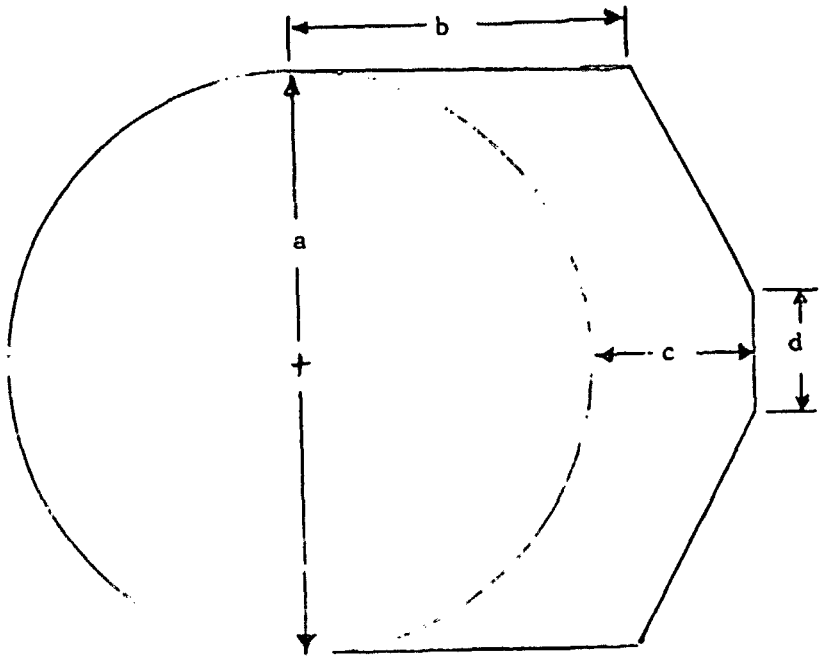
6.6 Sub-contracted material and parts. The packaging requirements of referenced documents listed in section 2 do not apply when material and parts are acquired by the contractor for incorporation into the equipment and lose their separate identity when the equipment is shipped.

6.7 Subject term (key word) listing.

Dry chemical
Extinguisher
Potassium bicarbonate
Cartridge
Fire

6.8 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-N202)



Dimension	Size 1	Size 2
a	12 inches	13 inches
b	7 inches	7.5 inches
c	3.5 inches	3.5 inches
d	2.5 inches	2.5 inches

FIGURE 1. Extinguisher envelope.

SH 13231671

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.

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DEPARTMENT OF THE NAVY
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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-E-24091C(SH)	EXTINGUISHER, FIRE, PORTABLE, POTASSIUM BICARBONATE, DRY CHEMICAL, CARTRIDGE-OPERATED TYPE

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.)

DD FORM 82 MAR 1426 PREVIOUS EDITION IS OBSOLETE.