

INCH-POUND

BB-E-2879A
April 06, 2001
 SUPERSEDING
 BB-E-2879
 August 31, 1995

FEDERAL SPECIFICATION

EXTINGUISHER, FIRE, CARBON DIOXIDE (CO₂), PORTABLE, WITH MOUNTING BRACKET, FOR AVIATION USE

The General Services Administration has authorized the use of this federal specification by all federal agencies.

1. SCOPE

1.1 Scope. This specification covers one type of non-refillable, hand-held, fire extinguisher, containing 2.5 pounds (lb) of carbon dioxide (CO₂), and its mounting bracket.

1.2 Part identification numbers. Part identification numbers for cataloging purposes shall be assigned in accordance with 6.4.

2. APPLICABLE DOCUMENTS

2.1 Government publications. The following documents, of the issues in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

FEDERAL SPECIFICATIONS

BB-C-101 - Carbon Dioxide (CO₂): Technical and U.S.P.

FEDERAL STANDARDS

FED-STD-123 - Marking for Shipment (Civil Agencies)
 FED-STD-595 - Colors Used in Government Procurement

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data that may improve this document should be sent to: Commander, Naval Air Warfare Center Aircraft Division, Code 414100 B120-3, Highway 547, Lakehurst, NJ 08733-5100.

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MILITARY STANDARDS

- MIL-STD-129 - Military Marking
- MIL-STD-2073-1 - DoD Standard Practice for Military Packaging

(Activities outside the Federal Government may obtain copies of federal specifications and standards as specified in the General Information section of the Index of Federal Specifications, Standards, and Commercial Item Descriptions. The Index is for sale on a subscription basis from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

(Single copies of these specifications, and other federal specifications required by activities outside the Federal Government for bidding purposes are available without charge from the General Services Administration, Federal Supply Service, Specification Section, Suite 8100, 470 L'Enfant Plaza, SW, Washington, DC 20407.)

(Federal Government activities may obtain copies of federal standardization documents and the Index of Federal Specifications, Standards, and Commercial Item Descriptions from established distribution points in their agencies.)

(Copies of military specifications and standards required by contractors in connection with specific procurement functions are obtained from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

UNDERWRITERS LABORATORY

- UL154 - Standard for Safety Carbon Dioxide Fire Extinguishers. (DoD Adopted)
- UL711 - Standard for Safety Fire Extinguisher, Rating and Fire Testing of.
(DoD Adopted)

(Private sector and civil agencies may purchase copies of these voluntary standards from the Underwriters Laboratories Incorporated, 333 Pfingston Road, Northbrook, IL 60062, or from American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- ASTM-B117 - Standard Test Method for Operating Salt Spray (Fog) Apparatus.
(DoD Adopted)
- ASTM-D3951 - Standard Practice for Commercial Packaging. (DoD Adopted)

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(Private sector and civil agencies may purchase copies of these voluntary standards from the American Society for Testing and Materials, 100 Barr Harbor Dr., West Conshohocken, PA 19408-2959.)

AMERICAN SOCIETY FOR QUALITY (ASQ)

ASQC-Z1.4 - Sampling Procedures for Tables for Inspection by Attributes. (DoD Adopted)

(Private sector and civil agencies may purchase copies of this voluntary standard from the American Society for Quality, 611 East Wisconsin Avenue, Milwaukee WI 53202.)

3. REQUIREMENTS

3.1 First article. When specified (see 6.2), samples shall be subjected to first article inspection in accordance with 4.3.

3.2 Material.

3.2.1 Cylinder. The cylinder shall be constructed from aluminum, steel, or a composite material that meets all the requirements of this specification.

3.2.2 Mounting bracket. The mounting bracket shall be made of a material that meets the applicable requirements of this specification.

3.3 Design and construction. Unless otherwise specified herein, the fire extinguisher assembly design and construction shall conform to UL154. The bracket design shall permit flush mounting. When properly installed in the mounting bracket, the cylinder shall not contact the mounting fasteners.

3.4 Assembly. The assembly shall consist of the extinguisher cylinder, delivery system, horn, identification and instruction labels, and mounting bracket. The dimensions of the assembly shall be as shown on figure 1 (see 4.5.1). The entire assembly, including the fully charged cylinder and bracket, shall weigh not greater than 9.25 pounds.

3.4.1 Cylinder contents. The cylinder shall contain 2.5 lb +2 ounces, -0 ounce of CO₂ conforming to BB-C-101.

3.4.2 Mounting bracket latch. The bracket shall have one latch that permits easy removal of the extinguisher from any mounted position when the latch is released. The unlatching process shall not require greater than two motions and one hand to release the extinguisher from the fastening mechanism. Once unfastened, the bracket parts shall not interfere with quick removal of the extinguisher from any position. Additionally, when a cotter pin is used as the latching mechanism, it shall be attached to the bracket to prevent foreign object damage. The overall

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assembly design shall permit the operator to remove the extinguisher by lifting the cylinder not greater than ½ inch away from the bracket base and then away from the bracket.

3.4.3 Discharge or burst disk indicator. The fire extinguisher shall be equipped with a visual device to notify the user of burst disk rupture or discharge. This indicator shall be securely fastened to the extinguisher and not be susceptible to accidental activation or discharge. The indicator shall be a different color than the other extinguisher components.

3.5 Cylinder retention and fragmentation resistance. Every cylinder shall remain unshattered and in one piece, and every bracket shall retain the cylinder, when tested in accordance with 4.5.2.

3.6 Crash retention. The bracket shall retain the extinguisher under the loading conditions specified in the test method of 4.5.3.

3.7 Performance.

3.7.1 Operation. The fire extinguisher shall be able to be removed from its bracket, have its safety pin removed, and be operated while the user is wearing heavy gloves or arctic mittens.

3.7.2 Discharge range. The extinguisher shall be able to discharge its contents from any orientation ranging from 80° to -80° from the vertical position. The discharge range shall be not less than 4 feet for the entire time the extinguisher is discharging.

3.7.3 Discharge time. The discharge time for expelling the contents of the extinguisher shall be not less than 8 seconds nor greater than 30 seconds at 68° ±3 °F.

3.7.4 Extinguishment. Two successive extinguishments are required during the 70 °F extinguishing tests referenced in UL154 and UL711. No greater than five extinguishing attempts shall be allowed to demonstrate the two successive extinguishments. The pan size for the extinguishing test, after exposure to rough usage and during low temperature extinguishing, shall be not less than 2 square feet.

3.7.5 Performance rating. The fire extinguisher shall have a performance rating of 2-B/C class, in accordance with UL711.

3.7.6 Climatic extremes. The fire extinguisher shall perform at temperatures between -40° and +120 °F. In addition, the fire extinguisher shall meet the performance requirements of 3.7 after the fire extinguisher has been subjected to the following conditions:

- a. Exposure to temperatures of -65° ±3 °F for not less than 16 hours
- b. Exposure to temperatures of +175° ±3 °F for not less than 4 hours.

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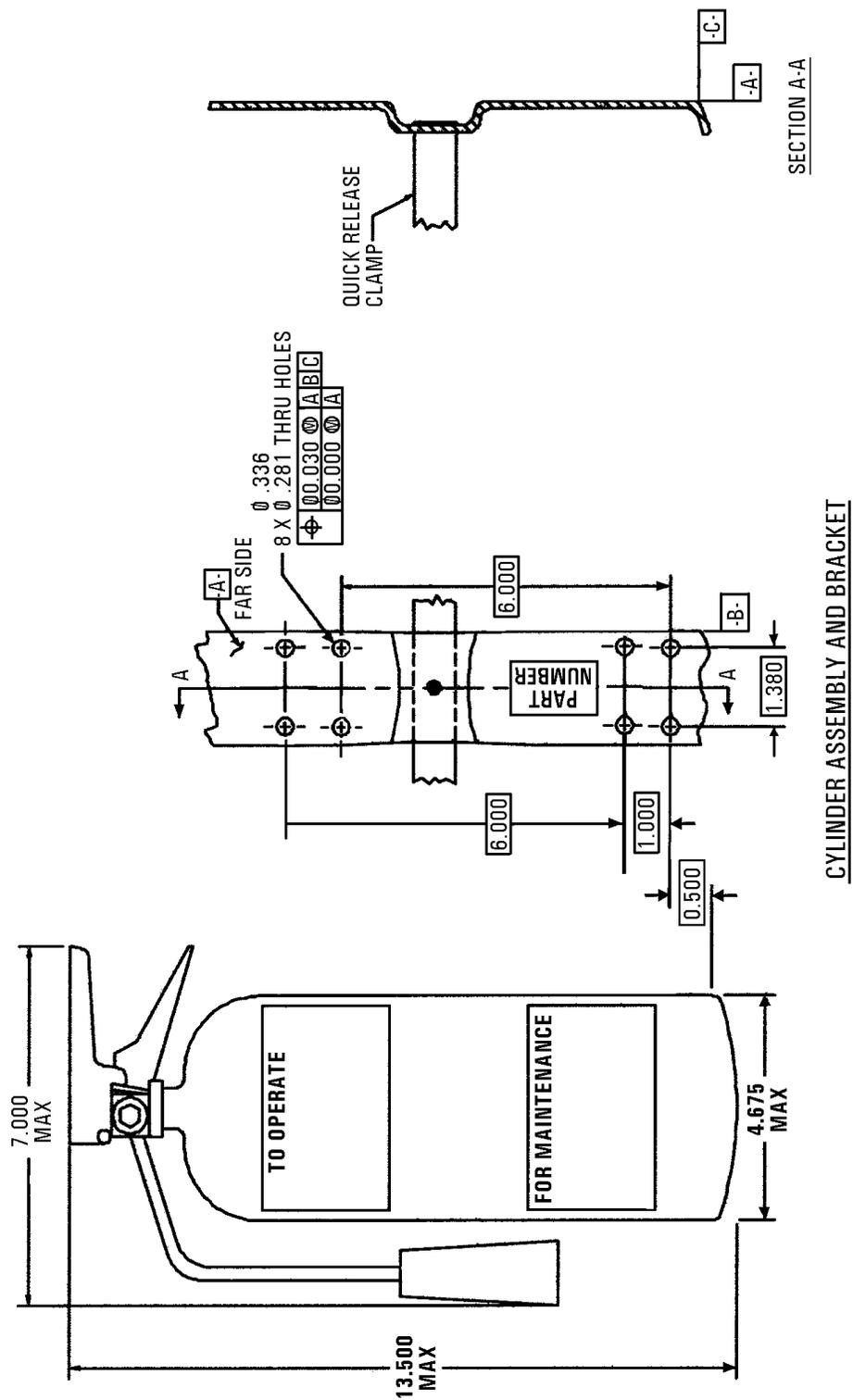


FIGURE 1. Extinguisher assembly (all dimensions in inches).

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3.8 Salt fog. The assembly finish shall provide substrate corrosion resistance. The assembly finish shall not blister, uplift, soften, nor exhibit other evidence of substrate corrosion, when tested in accordance with the salt fog test of 4.5.4.

3.8.1 Exterior surfaces. All exterior metal surfaces shall be treated to resist atmospheric corrosion. Coatings containing cadmium, lead, or chromium shall not be used. The cylinder shall be red, conforming FED-STD-595, color number 11105. All other surfaces shall be matte black.

3.9 Vibration. The extinguisher and bracket shall meet the vibration requirements of UL154, when tested in accordance with 4.5.5.

3.10 Rough usage. The extinguisher shall meet the rough usage requirements of UL154, when tested in accordance with 4.5.6.

3.11 Cylinder age. Cylinders delivered to the Government shall be not greater than 3 months from date of manufacture to the date received by the procuring activity.

3.12 Identification and instructions. The cylinder shall be marked in accordance with UL154 and 3.12.1 through 3.12.1.1.

3.12.1 Cylinder labeling. Permanent labels shall be affixed to the cylinder as shown on figure 1 and shall contain the labeling information in the size indicated as follows. The text shall be permanent and legible.

<u>Letter size (inch)</u>	<u>Label information</u>
3/16	EXTINGUISHER, FIRE, CO ₂ , 2½ LB, 2-B/C.
3/16	TO OPERATE
5/32	1. Pull ring pin.
5/32	2. Point horn close to base of fire.
5/32	3. Depress lever for discharge and keep base of flame covered.
3/16	CAUTION
5/32	1. Avoid breathing smoke.
5/32	2. Ventilate vehicle after discharge.
5/32	3. Avoid contact with skin or clothing.
5/32	4. Do not direct discharge toward face.

Maintenance instructions shall be placed below the operating instructions and labeled in accordance with the following:

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Letter size (inch)	Label information
3/16	FOR MAINTENANCE
3/16	CYLINDER (Material: aluminum, steel, composite)
3/16	PART NUMBER BBE2879A
3/16	Component of BBE2879A Assembly
7/64	Replace with a new charged extinguisher, part number BBE2879A, immediately after use or 5 years after date of manufacture.
5/64	Weigh extinguisher every six months and replace if the gross weight has decreased by four ounces or more.
3/32	"NATIONAL STOCK NUMBER (NSN)"
3/32	"MANUFACTURER'S NAME AND CAGE CODE"
3/32	"CONTRACT NO."
3/32	DATE OF MANUFACTURE MONTH "___" YEAR "___"
3/32	EXTINGUISHER ASSEMBLY GROSS WEIGHT "___"LB "___"OZ
7/64	Property of the U.S. Government

3.12.1.1 Mounting bracket labeling. The bracket shall have a permanently affixed label with the following information in the indicated size:

<u>Letter size (inch)</u>	<u>Label information</u>
3/32	FIRE EXTINGUISHER BRACKET
3/32	PART NUMBER BBE2879A
3/32	Component of BBE2879A Assembly

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, 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 that supplies and services conform to prescribed requirements.

4.2 Classification of inspections. 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 all requirements and tests specified in this specification, and shall be mandatory on the first production lot of a contract or purchase order and when specified (see 6.2). The cylinder retention and fragmentation resistance

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testing (see 4.5.2) shall be conducted by the Government. The salt fog test (see 4.5.4) shall be performed at the manufacturer's own facility or any other facility that can perform this test, unless disapproved by the Government. Failure of any examination or test shall result in first article disapproval.

4.3.1 First article test sample. Test samples and other information required shall be representative of production units and shall consist of the following:

- a. Twelve fire extinguisher assemblies for fragmentation resistance testing.
- b. Twenty-four fire extinguisher assemblies for all other examinations (inspections) and testing. Twelve of the twenty four assemblies are to be used for the "One-year time leakage test" in accordance with UL154. The one-year leakage test specified in UL154 can be accelerated through leak detection methods versus weight loss detection.
- c. Identification of material used in construction of the cylinder (see 3.2.1).
- d. A certified test report showing that the fire extinguisher conforms to the requirements of this specification, UL154, and UL711.

The following components shall be tested separately and the test results shall be included in the submitted test report:

1. Twelve frangible discs
2. Twelve valves
3. Six horns

4.4 Quality conformance inspection. Quality conformance inspection shall consist of all tests and inspections specified in table I. Unless otherwise stated in the test method, room temperature shall be defined as $70^{\circ} \pm 10^{\circ} \text{F}$ and relative humidity as 50 ± 10 percent. Sampling for quality conformance shall be in accordance with ASQC-Z1.4, Inspection Level S-1. There shall be no defects.

TABLE I. Quality conformance inspections.

Requirement Description	Requirement Paragraph	Inspection Paragraph	Test Method
Design and Construction	3.3	-	UL154
Assembly	3.4	4.5.1	-
Crash retention	3.6	4.5.3	-
Performance	3.7	-	UL154 and UL711
Vibration	3.9	4.5.5	UL154
Rough usage	3.10	4.5.6	UL154
Cylinder age	3.11	-	-
Identification	3.12	-	UL154

4.5 Inspections.

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4.5.1 Assembly. The fire extinguisher assembly shall be inspected for conformance to the dimensions on figure 1.

4.5.2 Cylinder retention and fragmentation resistance. The cylinder retention and fragmentation resistance shall be verified by shooting fully charged cylinders with a 0.30 caliber armor piercing cartridge, M2, at a projectile muzzle velocity of 2,765 feet/second. Unless otherwise specified by the test facility, the cylinder shall be mounted in its bracket, which shall be securely mounted using its mounting hardware, at a distance of 20 ± 5 feet from the gun muzzle, and then impacted with fully tumbled projectiles. The cylinder shall be supported and constrained by its normal latch and bracket during the test. The test shall be conducted at ambient temperature. A separate cylinder and mounting bracket shall be used for each test, as follows:

- a. With the longitudinal axis of the cylinder normal to the line of fire.
- b. With the longitudinal axis of the cylinder 45 degrees from normal toward the gun position and the outlet port (neck) of the cylinder facing away from the weapon.
- c. With the longitudinal axis of the cylinder parallel to the line of fire with outlet port (neck) facing away from the gun.
- d. With the longitudinal axis of the cylinder normal to the line of fire. The fully tumbled projectile shall penetrate through the back of the bracket.

4.5.3 Crash retention. Using a separate bracket for each direction, the assembly shall be subjected to a static loading of 50 times its weight in the downward, upward, lateral, and forward directions.

4.5.4 Salt fog. The fire extinguisher and bracket assembly shall be exposed to 500 hours salt fog in accordance with ASTM-B117. Upon removal from the salt fog chamber, the assembly shall be examined for conformance to the requirements of this specification (see 3.8).

4.5.5 Vibration. Vibration testing of the fire extinguisher and bracket assembly shall be performed in accordance with UL154.

4.5.6 Rough usage. Rough usage testing shall be in accordance with UL154, except that the fully charged extinguisher shall be pressure checked before dropping.

5. PACKAGING

5.1 Packaging and preservation. Unless otherwise specified in the contract or purchase order, this item shall be packaged in accordance with ASTM-D3951 or MIL-STD-2073-1, level B or C.

5.2 Marking. Unless otherwise specified in the contract or purchase order, this item shall be marked in accordance with FED-STD-123 or MIL-STD-129.

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6. NOTES

INFORMATION FOR GUIDANCE ONLY. (This section contains information of a general or explanatory nature that is helpful, but is not mandatory.)

6.1 Intended use. The intended use of this fire extinguisher assembly is to extinguish petroleum and electrical fires in crew compartments of aircraft, particularly tactical military aircraft, and for general use outside the aircraft (remote tactical landing locations). In addition, the extinguisher assembly possesses gunfire and crash integrity.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification, including any amendments.
- b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1 and 2.2).
- c. Whether first article inspection is required (see 3.1 and 4.3).
- d. Packaging, preservation and marking requirements (see 5.1 and 5.2).
- e. FAR clause 52.223-3.

6.3 Cross reference. Cylinder material designations (types) are not used in this revision. The type designations have been deleted and the part identification number (PIN) (see 6.4) reflects that deletion.

6.4 Part identification number (PIN). Part numbers may be coded as follows:

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Specification identifier

6.5 Subject term (key word) listing.

Carbon dioxide
Fire fighting equipment
Fragmentation resistant

6.6 Changes from previous issue. Asterisks (or vertical lines) are not used in this revision to identify changes with respect to the previous issue due to the extensive changes.

MILITARY INTERESTS:

Military coordinating activity:

Navy - AS

CIVIL AGENCY
COORDINATING ACTIVITY:

GSA-FSS

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Custodian:

Army - AV

Preparing activity:

Navy - AS

Review activity:

DLA - CC

(DoD Project 4210-0615)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7, and send to preparing activity.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of 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.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER BB-E-2879A	2. DOCUMENT DATE (YYYYMMDD) 20010406
3. DOCUMENT TITLE EXTINGUISHER, FIRE, CARBON DIOXIDE (CO ₂), PORTABLE, WITH MOUNTING BRACKET, FOR AVIATION USE		
4. NATURE OF CHANGE (<i>Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.</i>)		
5. REASON FOR RECOMMENDATION		
6. SUBMITTER		
a. NAME (<i>Last, First, Middle Initial</i>)	b. ORGANIZATION	
c. ADDRESS (<i>Include ZIP Code</i>)	d. TELEPHONE (<i>Include Area Code</i>) (1) Commercial (2) DSN (<i>If applicable</i>)	7. DATE SUBMITTED (YYYYMMDD)
8. PREPARING ACTIVITY		
a. NAME COMMANDER NAVAL AIR WARFARE CENTER AIRCRAFT DIVISION	b. TELEPHONE (<i>Include Area Code</i>) (1) Commercial (732) 323-2947	(2) DSN 624-2947
c. ADDRESS (<i>Include ZIP Code</i>) CODE 414100B120-3 HIGHWAY 547 LAKEHURST, NJ 08733-5100	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Standardization Program Office (DLSC-LM) 8725 John J. Kingman Road, Suite 2533 Fort Belvoir, Virginia 22060-6221 Telephone (703) 767-6888 DSN 427-6888	