

INCH -POUND

MIL-DTL-52031E  
28 SEPTEMBER 2009  
SUPERSEDING  
MIL-E-52031D  
5 September 1979

MILITARY SPECIFICATION  
EXTINGUISHER, FIRE, VAPORIZING- LIQUID  
CF<sub>3</sub>BR; HAND-HELD WITH BRACKET

**INACTIVE FOR NEW DESIGN DATED, 10 APRIL 1998**

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

1. SCOPE

1.1 Scope. This specification covers a one-time usage, non-refillable, hand-held fire extinguisher (HHFE) containing CF<sub>3</sub>BR (ASTM D5632) and pressurized with nitrogen.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

2.2 Government documents

2.2.1 Specifications standard, and handbooks, the following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of These documents are those cited in the solicitation or contract.

Comments, suggestions, or questions on this document should be addressed to: Commander, U.S. Army Research, Development and Engineering Center, ATTN: RDMR-SET, Redstone Arsenal, AL 35898-5000. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at [http:// assist.daps.dla.mil](http://assist.daps.dla.mil).

AMSC N/A

FSC 4210

**DISTRIBUTION STATEMENT A.** Approved for public release; distribution is unlimited.

## MIL-DTL-52031E

### FEDERAL SPECIFICATION

UL299	Fire Extinguisher Dry Chemical
TT-P-645	Primer, Paint, Zinc-Meliorate, Alkyd Type

### FEDERAL STANDARDS

FED-STD-595/17178 Silver/Aluminum

(Copies of this document is available online at <http://assist.daps.dla.mil/quicksearch/>)

### COMMERICAL ITEM DESCRIPTIONS

A-A-59503	Technical Nitrogen
-----------	--------------------

(Copies of this document are available online at <http://assist.daps.dla.mil/quicksearch/>)

### DEPARTMENT OF DEFENSE SPECIFICATION

DoD-P-15328	Primer (Wash) Pretreatment (Formula No. 117 Metal) For (Metric)
MIL-PRF-24635	Coating Systems, Weather-Resistant, Exterior Use

### DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-129	Military Marking for Shipment and Storage
MIL-STD-130	Identification Marking of US Military Property
MIL-STD-810	Environmental Engineering Considerations & Laboratory Tests
MIL-STD-1916	Preferred Methods for Acceptance of Product

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/>.)

2.3 Non-Government Publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

#### AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/ASQZ1.4 Sampling Procedures and Tables for Inspection by Attributers

(Copies of ANSI/ASQZ1.4 are available online at [www.asq.org](http://www.asq.org))

#### AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM), International

ASTM D5632	Halon 1301, Bromotrifluoromethane (CF3BR)
ASTM E171	Materials Flexible Barrier, Conditioning and Testing, Standard Atmospheres FOR

(Copies of ASTM D5632 are available online at <http://www.astm.org>)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

## MIL-DTL-52031E

3.1 Design and construction. The fire extinguisher shall be designed and constructed to withstand the strain, jar, vibrations, and other conditions incident to shipping, storage, installation, and service. The extinguisher shall be built using a new hydrostatically tested cylinder with less than one year from date of manufacture, all new component parts and purged with nitrogen or a vacuum drawn prior to charging. The fire extinguisher triggering mechanism shall be designed in such a manner that it may be operated by personnel wearing heavy work gloves or arctic mittens. All components shall be designed and so located with respect to each other that ease of handling is assured and injury to operating personnel is not likely to occur. The complete fire extinguisher shall consist essentially of cylinder with siphon tube, cylinder seal assembly, head assembly with valve, and bracket. The fire extinguisher shall be charged with 2 pounds, 11 ounces to 2 pounds, 14 ounces of bromotrifluoromethane extinguishing agent, conforming to ASTM D5632, and shall be stabilized to pressures at nominal temperatures as shown in table I with nitrogen conforming to CID A-A-59503, Type I, class 1 or 2, Grade B. The fully charged fire extinguisher shall weigh not more than 7 pounds, 11 ounces without the mounting bracket. The overall height of the fire extinguisher with safety pin installed and bracket assembly shall not exceed 13-½ inches  $\pm$  ½ inch. With the safety pin removed, partial discharge of the contents and top handle in an elevated position, the overall height of the fire extinguishers shall not exceed 14-½ inches  $\pm$  ½ inch.

TABLE I. Pressure – Temperature stabilization requirements.

Temperature (°F)	PSI (Min)	PSI (Nominal)	PSI (Max)
60	339	349	359
61	342	352	362
62	346	356	366
63	349	359	369
64	353	363	373
65	357	367	377
66	361	371	381
67	365	375	385
68	370	380	390
69	374	384	394
70	377	387	397
71	379	389	399
72	382	392	402
73	385	395	405
74	387	397	407
75	390	400	410
76	393	403	413
77	396	406	416
78	399	409	419
79	403	413	423
80	406	416	426

3.2 First article. Sample products shall be subjected to first article inspection in accordance with 4.2.

3.3 Material. Material shall be as specified herein. Materials not specified shall be selected by the contractor and shall be subject to all provisions of this specification. Horns fabricated of rubber products shall not be subjected to the test specified in 4.4.2.8.1. Horns fabricated of plastic products shall not be subjected to the test specified in 4.4.2.8.4

3.4 Cylinder shell. The cylinder shell shall conform to Department of Transportation (DOT) regulations, service pressure of 500 psig. The cylinder shell shall be clean and dry prior to assembly. All preservative oil shall be completely removed in accordance with the preservative oil manufacturers' procedure. The

## MIL-DTL-52031E

cylinder head connection shall be as shown in Figure 1. The cylinder with siphon tube installed shall have an internal volume of 80 cubic inches, plus 2 cubic inches or minus 1 cubic inch, and shall have an external diameter of 3.50 inches  $\pm$  0.06 inch.

3.4.1 Siphon tube. The fire extinguisher shall be fitted with a metal siphon tube located so that 90% of the full charge shall be discharged when the extinguisher is held 45° to the horizontal with the valve and discharge horn assembly facing upward. The siphon tube shall be attached in a leak proof manner by threading, flaring, crimping, compression fitting, or copper flaring. A soft-soldered (sweated) connection shall not be used. The siphon-tube attachment design and method will eliminate any possibility of leakage at the siphon tube attachment point.

3.5 Cylinder-seal assembly. The cylinder-seal assembly shall be as shown in Figures 2, 3, and 4. The seal-disk assembly shall be tightened to 25 foot-pound  $\pm$  1 foot-pound.

3.5.1 Seal disk. The seal disk shall burst at a pressure of 1050 psig  $\pm$  100 psig. The seal disk shall be marked with the letters "FR" not exceeding 3/32 inch in height. When installed in the cylinder, some portion of the "FR" marking shall be visible. The seal disk design shall not impede agent flow by partially covering the puncture pin's bevel area flowing puncture of the disk

3.5.2 Cylinder-seal washer. The cylinder-seal washer shall be made from soft copper or nylon.

3.6 Cylinder-head assembly. The head assembly shall consist of a gasket, an internally threaded swivel nut for attaching the assembly head to the cylinder, a valve with puncture pin, safety pin lock, hand grip, swivel arm, nozzle orifice, and horn. Cylinder head assembly agent passageways shall be large enough to assure unrestricted agent flow in the event cylinder debris from minor corrosion is present

3.6.1 Cylinder-head gasket. The gasket shall prevent leakage of the extinguisher contents between the head assembly and the cylinder after the extinguisher handle is depressed. The gasket shall be such that no leakage shall occur throughout the operating temperature range from -50° F to +120° F. The cylinder head gasket material and design shall maintain its thickness and sealing capabilities for the duration of its 12 year product life despite repeated (twice annual) cylinder head removals for inspection and weighing and repeated swiveling (see 3.6.2) of the head assembly on the cylinder. The gaskets thickness or compressibility shall not be degraded by exposure to OE 30 lubricant or lifetime daily exposures to temperatures of 185 °F.

3.6.2 Threaded swivel nut. The swivel nut shall allow a full 360° rotation of the head assembly when attached to the cylinder head to allow orientation of the head, relative to the cylinder before tightening. The method of attaching the swivel nut to the valve assembly shall be the threaded fastener type. Swagging or riveting is not acceptable.

3.6.3 Valve. The valve shall have a shutoff mechanism with a puncture pin. The puncture pin shall be cut at angle and long enough to ensure proper penetration of the seal disk. When the cylinder head assembly is secured on the cylinder, the puncture pin shall not puncture or make contact with the frangible seal disk when the safety pin is pulled and the upper portion of the valve handle is depressed to a point where the inner safety pin hole is completely blocked. To allow discharge in the event of the seal disk rupture, the shutoff valve shall be held in a semi-open position when the safety pin is installed. The valve-opening lever shall require an actuating force of not less than 8.25 pounds or more than 11 pounds when measured approximately 1 inch from the end of the actuating handle. The valve-opening lever shall be self-closing. After puncture of the seal disk and with the valve mechanism released, the valve shall block the fire extinguisher discharge, and the assembly connections and seals shall not leak. The puncture pins design will ensure unrestricted agent flow when the puncture pin penetrates the seal disk. No part of the seal disk may cover or enter the end of the puncture pin.

3.6.4 Safety pin. The safety pin shall be fitted with a seal conforming to UL 299 for visually indicating the removal of the safety pin. A chain attaching the safety pin to the head assembly shall be provided to prevent removal or detachment of the safety pin. The safety pin shall easily fit into the handle valve body

## MIL-DTL-52031E

assembly and shall incorporate a ring pull for easy withdrawal. A self-locking seal, affixed through the safety pin ring over and around the actuating lever, shall be provided with each extinguisher. The safety pin shall not allow activation of the extinguisher when a 50 pound force is applied simultaneously against the outer ends of the valve-opening lever and the carrying handle. Blocks or spacers shall not be used in conjunction with the safety pin.

**3.6.5 Swivel arm.** The swivel arm shall be attached to the head assembly. The swivel arm shall have a vertical swivel from a downward position where the horn touches the cylinder to an upward position in line with but not exceeding the longitudinal axis of the extinguisher cylinder. A lifting force of not less than 4 foot-pounds or more than 8 foot-pounds applied to the end of the assembly shall be required to produce angular displacement of the swivel arm. Jarring, vibration, or handling shall not detach the horn from the swivel arm. The swivel arm shall incorporate a 30 degree bend near the swivel (on the front face opposite the handle-hold). The sweep may be limited by the cylinder body when the head is attached to the cylinder body. When in the rest position, the swivel-arm and horn assembly shall not extend beyond the cylinder bottom.

**3.6.6 Grip.** When in the operating position, the grip shall be positioned at an angle of  $60^{\circ} \pm 5^{\circ}$  with the cylinder longitudinal axis. The grip shall have a breadth of not less than 1 inch, and no sharp edges shall be exposed. Metal thickness shall not be less than 0.060 inch. The grip shall be provided with finger grip depressions.

**3.6.7 Discharge nozzle and horn.** The discharge horn shall reduce the turbulence and direct the extinguishing agent discharge vapor stream. The discharge horn shall not be less than 3 ½ inches long. The discharge horn shall be fabricated of tough, water-resistant and heat-resistant material, having a non-corrosive orifice bushing molded or securely built into the inlet of the horn. The horn material shall have dielectric strength to withstand for a minute, without breakdown, a voltage of 5000 volts, 60-cycle ac. The horn shall withstand aging, weathering, and mechanical and thermal shock encountered by operation within climatic extremes without cracking, appreciable change in flexibility, or evidence of distortion or other damage. The horn shall be attached to the swivel arm so that no separation occurs during handling or operation of the extinguisher. The expanding orifice or primary point of expansion of the liquefied extinguishing agent shall be located in the discharge horn at the point where the horn connects to the swivel arm.

**3.7 Performance.** The discharge time for expelling the liquid contents (remaining agent weight less than 10% of label agent weight) of the extinguisher at 68° F shall not be less than 8 seconds and not more than 12 seconds. The discharge range shall not be less than four feet for the full time the extinguisher is discharging. The extinguisher shall show no signs of leakage when tested with a leak detector, which will detect a leakage rate as low as 0.1 ounce or less per year. After the extinguisher has been removed from the bracket ring and the safety pin has been extracted and the swivel arm adjusted to the proper angle for use the extinguisher shall be operable by an operator using one hand.

**3.8 Climatic extremes.** The extinguisher shall operate at any air temperature from -50° F without benefit of solar radiation, to +120° F while exposed to a solar radiation intensity of 360 BTU/ft<sup>2</sup>/hour, and shall be capable of safe storage at temperatures from -80° F for a period of 72 hours to +185°F for a period of four hours daily.

**3.9 Corrosion resistance.** The fire extinguisher shall withstand a salt spray for 200 hours without evidence of corrosion sufficient to impair functioning of the extinguisher or to prevent manipulation of fittings and connections with regular servicing tools.

**3.10 Drop resistance.** The fully charged extinguisher shall be operable after being subjected to at least three drops from a height of not less than four feet.

**3.11 Vibration.** The extinguisher mounted in the bracket shall withstand vibration forces in the vertical position at the rate of 60 cps at 1¼ g acceleration forces.

## MIL-DTL-52031E

3.12 Bracket. A mounting bracket shall be furnished with each extinguisher. The clamp with spring lock shall hold the extinguisher when subjected to the acceleration forces specified herein. The bracket shall permit quick, easy removal of the extinguisher from any position when the cam lock is released. Dimensions shall be as shown in Figure 5.

3.12.1 Static loading. The bracket shall hold the extinguisher against static loading of 200 pounds downward and 88 pounds upward along the axis of the extinguisher mounted vertically. The bracket shall also hold the extinguisher with a 200 pound outward loading applied to the extinguisher at a point midway between the strap and the bottom of the bracket. Each load shall be applied and then removed before adding the next load.

3.13 Instructions and nameplate. The instructions and nameplate shall be as follows using aluminum as the basic plate material:

Letter size (inch)	Data	Inscription system
3/16	To operate.	Black on natural color metal.
5/32	1. Pull ring pin.	Black on natural color metal.
5/32	2. Point horn close to base of fire	Black on natural color metal.
5/32	3. Depress trigger for discharge and keep base of flames covered	Black on natural color metal.
5/32	4. Avoid breathing of smoke	Black on natural color metal.
5/32	5. Remove valve and horn assembly and discard used cylinder.	Black on natural color metal.
1/8	Extinguisher, Fire, CF <sub>3</sub> BR, 2 ¾ pounds	Natural metal color on black.
7/64	For maintenance.	Natural metal color on black.
5/64	After 12 years from date of manufacture return to DDRV-OSD as NSN 6830-01-376-8394 condition code F.	Natural metal color on black.
5/64	Weigh extinguisher cylinder every 6 months and replace if gross weight has decreased by 4 ounces or more: lubricate cylinder neck threads with one drop OE 30 before reassembly.	Natural metal color on black.
3/32	NSN 6830-00-555-8837	Natural metal color on black.
3/32	FABRICATOR	Natural metal color on black.
3/32	CONTRACT NO.	Natural metal color on black.
3/32	GROSS WEIGHT	Natural metal color on black.
3/32	Weight of full charged cylinder w/o head and horn	Natural metal color on black.
3/32	___ lb ___ oz Date of fabrication.	Natural metal color on black.
7/64	Property of U.S. Government	Black on natural color metal.
7/16	Fabricator's trade mark, Optional name, address, etc.	

The instructions and nameplate shall be attached to the cylinder.

3.13.1 Torque label. A separate label near the top of the cylinder shall be provided with the words "Torque to 160 inch pounds."

## MIL-DTL-52031E

3.14 Identification marking. The fire extinguisher shall be identified in accordance with MIL-STD-130.

3.14.1 Extinguisher cylinder. Each extinguisher cylinder shall be plainly and permanently marked in accordance with DOT regulations by stamping on the shoulder of the cylinder, starting near the neck and in sequence downward as follows:

- One side – DOT specification and service pressure, and “SPUN” when spun cylinders are supplied, in characters not less than 3/16 inches high. The symbol of the Department of the Army, “DA,” and the manufacturer’s serial number-letters in characters not less than 1/4 inch high.
- The manufacturer’s mark or symbol.
- Third party inspection mark or Government inspector’s stamp, when applicable.
- Other side – (Opposite the above marking, and as near the neck as possible).
- Military specification number.
- Original pressure test date (month and year).

3.15 Treatment and painting.

3.15.1 Treatment and painting of fire extinguisher bracket. The Hand Held fire extinguisher bracket shall be painted Finish Color No. 17178 or FED-STD-595.

3.15.2 Fire extinguisher and components. The portion of the extinguisher and its components and parts normally painted shall be treated and painted in accordance with Table below, Finish Color No. 12.205;

	Pretreatment	Primer	Topcoat
All environments other than marine	DoD-P-15328	TT-P-644 Or SSPC-Paint25	Master Painters Institute (MPI), Reference #94, exterior alkyd, semi-gloss, MPI Gloss Level 5
For Marine Environments	DoD-P-15328	TT-P-645	MIL-PRF-24635
Coats (Marine Environments)	-	1 (1)	1 (2)
Dry Film Thickness (mils) per Applied Coat (Marine Environments)	0.3-0.5 (0.3-0.5)	1.0-1.5 (min 2.0)	1.0-1.5 (min 2.0)

3.16 Workmanship. All parts, components, and assemblies of the fire extinguisher shall be clean and free from sand, dirt, fins, pits, spurs, scale, flux, and other harmful extraneous material. All external edges shall be rounded, beveled or de-burred. Internal parts and surfaces requiring sharp edges will be formed only as necessary. All burrs and rough edges shall be removed.

#### 4. VERIFICATION

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



## MIL-DTL-52031E

- (a) First article inspection (see 4.2)
- (b) Conformance inspection (see 4.3)

4.2 First article inspection. First article inspection shall be performed on three preproduction extinguishers to prove prior to starting production that the extinguishers comply with the requirements of this specification. The extinguishers shall be produced in accordance with the contractor's normal production processes and tooling. This inspection shall include examination in accordance with 4.4.1 on each of the 3 samples and the testing sequence as shown in table II. Unless otherwise specified (see 6.2), the government will conduct all of first article examination and testing.

TABLE II. First article testing requirements and sequence

Sample Number	Testing requirements and sequence							
1	4.4.2.7 – Corrosion	4.4.2.9 – Bracket Loading	4.4.2.10 – Puncture	4.4.2.11 – Safety Pin				
2	4.4.2.3 – Vibration	4.4.2.9 – Bracket Loading	4.4.2.10 – Puncture	4.4.2.11 – Safety Pin	4.4.2.1 – Seal Torque	4.4.2.2 – Leaks	4.4.2.4 – Seal Disk Burst Pres.	4.4.2.5 – Drop & Discharge
3	4.4.2.3 – Vibration	4.4.2.6 – Performance	4.4.2.8.1 – Acc. Aging for materials	4.4.2.8.2 – Impact Shock	4.4.2.8.3 – Thermal Shock	4.4.2.8.4 – Acc. Aging	4.4.2.8.5 – Dielectric	

4.2.4 Inspection failure. Failure of the first article extinguishers to meet any requirements specified herein during and as a result of the examinations and tests specified in 4.2 shall be cause for rejection.

4.3 Conformance inspection. Conformance inspection shall consist of examination and testing specified under 4.4.1, 4.4.2.1, 4.4.2.2, and 4.4.2.11.

4.3.1 Sampling. Sampling shall be in accordance with ANSI/ASQ Z1.4, Inspection Level II.

4.3.1.1 Examination. Samples shall be examined for the major and minor characteristics for possible defects as specified in 4.4.1. AQL shall be 2.5% for major defects, and 4.0% for minor defects.

4.3.1.2 Tests. Samples shall be tested as specified in 4.4.2.1, 4.4.2.2, and 4.4.2.11. AQL shall be 2.5%.

#### 4.4 Inspection procedure.

4.4.1 Examination. The sample extinguishers shall be examined for the following characteristics for possible defects:

<u>Major</u>		<u>Requirements Paragraph</u>
101.	Design and construction not as specified.	3.1
102.	Material not as specified.	3.3
103.	Cylinder shell not as specified.	3.4
104.	Siphon tube not as specified.	3.4.1
105.	Cylinder-seal assembly not as specified.	3.5
106.	Seal disk not as specified.	3.5.1
107.	Cylinder-seal washer not as specified.	3.5.2
108.	Cylinder-head assembly not as specified.	3.6
109.	Cylinder-head gasket not as specified.	3.6.1
110.	Threaded swivel not as specified.	3.6.2
111.	Valve not as specified.	3.6.3



## MIL-DTL-52031E

112.	Safety pin not as specified.	3.6.4
113.	Swivel arm not as specified.	3.6.5
114.	Grip not as specified.	3.6.6
115.	Discharge orifice bushing and horn not as specified.	3.6.7
116.	Bracket not as specified.	3.12
117.	Instructions and nameplate not as specified.	3.13
118.	Weight not stamped on nameplate.	3.13

Minor

201.	Identification marking not as specified.	3.14
202.	Treatment and painting not as specified.	3.15
203.	Workmanship not as specified.	3.16

4.4.2 Tests.

4.4.2.1 Seal torque. The extinguisher shall be secured in an upright position. 25 foot-pounds  $\pm$  1 foot-pound of torque shall be applied to the cylinder seal using a torque wrench. This test can be conducted at the time of assembly. Movement or tightening of the cylinder seal during this application shall constitute failure of this test.

4.4.2.2 Leaks. A fully charged extinguisher shall be tested for leaks using a detector, which shall detect a leakage rate as low as 0.1 ounce or less per year. Any detection of leakage shall constitute failure of this test. The detector to be used shall be calibrated with a known value of gas prior to performing the test specified herein.

4.4.2.3 Vibration. The fully-charged extinguisher shall be mounted in its bracket and undergo vibration testing in both a horizontal and vertical position. The mounted extinguisher shall be subjected to vibrations in the vertical direction at the rate of 60 cps at  $1\frac{1}{4}$  g acceleration for a period of one hour for each position. Breaking or loosening of components, inability of the bracket to hold, inability of the swivel arm to swivel as specified in 3.6.5, or discharge of the extinguisher in less than 8 seconds or more than 12 seconds, shall constitute failure of this test.

4.4.2.4 Seal disk burst pressure. The seal disk assembly shall be inserted into a hydraulic test rig. Hydrostatic pressure shall be applied slowly until the disk bursts. A burst pressure of less than 950 psig or greater than 1150 psig shall constitute failure of this test.

4.4.2.5 Drop and discharge. The fully-charged extinguisher shall be dropped with the head assembly from a height of four feet onto a solid, concrete surface from each of the following positions:

- (a) Longitudinal axis parallel to the concrete surface.
- (b) Extinguisher bottom down.
- (c) Extinguisher head down.

A leak detector shall determine whether the extinguisher is leaking. The head assembly shall be rotated. The extinguisher shall be discharged completely. Any leakage, discharge, of the extinguishing agent in less than 8 seconds or more than 12 seconds, discharge range of less than four feet, or inability of the head assembly to rotate 360° shall constitute failure of this test.

4.4.2.6 Performance. The fully-charged extinguisher shall be weighed. The weight of the fully charged extinguisher extinguishing agent shall be between 2 pounds, 11 ounces, and 2 pounds, 14 ounces. Weight shall be determined at laboratory atmospheric conditions in accordance with ASTM E171. The extinguisher shall be cooled to a temperature of  $-50^{\circ}\text{F} \pm 2^{\circ}\text{F}$  and the temperature shall be maintained for not less than 12 hours. At the conclusion of this period, the extinguisher shall be immediately discharged completely. Any leakage, discharge of the extinguishing agent in less than 8 seconds or more than 12 seconds, discharge range of less than four feet, or inability of the head assembly to rotate 360° shall constitute failure of this test.

## MIL-DTL-52031E

Sticking of the valve or clogging of the discharge orifices shall constitute failure of this test.

4.4.2.7 Corrosion. The extinguisher shall be subjected to salt-spray action specified in MIL-STD-810, Method 509. The extinguisher shall be operated, and the fittings and connections shall be manipulated with regular servicing tools. Non-conformance to 3.9 shall constitute failure of this test.

#### 4.4.2.8 Horn.

4.4.2.8.1 Accelerated aging test for plastic materials. The horn shall be placed in a circulating air oven, heated to +194° F, and held at this temperature for 94 hours. When removed from the oven, the horn shall show no cracking or deterioration. The horn shall then be subjected to the impact test in 4.4.2.8.2.

4.4.2.8.2 Impact shock. The horn shall be cooled to -5° F. The horn shall be supported with a clamping mechanism at the handgrip so that the point of impact will be on the external surface, approximately two inches from the open end of the horn. A five pound steel ball shall be dropped, free and unguided from a height of one foot upon the horn. This test shall be repeated a total of four times. Fracture or cracks shall constitute failure of this test.

4.4.2.8.3 Thermal shock. The horn shall be soaked in an ice-brine ( $\text{CaCl}_2$ ) bath at -22° F for a period of 30 minutes. The horn shall be removed rapidly and immediately plunged into boiling water (+212° F) for a period of 30 seconds. Fractures or cracks shall constitute failure of this test.

4.4.2.8.4 Accelerated aging. The horn shall be placed in a pressure bomb, pressurized with oxygen at 290 to 310 psig, and then the pressure bomb shall be placed in an oven. The oven shall be heated to 160° F, and the temperature shall be held for 24 hours. The bomb and horn shall cool, and then the pressure shall be slowly released. Fractures or cracks shall constitute failure of this test.

4.4.2.8.5 Dielectric. An ac test potential of 5000 volts shall be applied to the horn for a period of one minute. Arcing or evidence of electrical breakdown shall constitute failure of this test.

4.4.2.9 Bracket loading. A static load of 200 pounds downward, and 88 pounds upward shall be applied long the axis of the extinguisher mounted vertically. A force of 200 pounds shall be applied outward (90° to a longitudinal axis) at a point midway between the strap and the bottom of the bracket. Each load shall be applied, and then removed before adding the next load. Structural failure and permanent deformation of the bracket or release of the fastening attachment (cam lock) shall constitute failure of this test.

4.4.2.10 Puncture. The cylinder-head assembly shall be secured onto the extinguisher cylinder. When the swivel nut is tightened, the safety pin shall be removed, and the upper portion of the valve shall be depressed to a point where the inner holes of the safety pin are not visible. The valve shall be released, and the cylinder-head assembly shall be removed from the extinguisher cylinder. Puncture of the frangible safety disk before the hole is completely blocked, or any indication of contact between the puncture pin and the frangible safety disk after the cylinder-head assembly has been removed shall constitute failure of this test.

4.4.2.11 Safety pin. The cylinder-head assembly shall be secured to the extinguisher. With the swivel nut tightened, the safety pin in place, 50 pounds of force shall be applied to the outer ends of the actuating lever, and lower carrying handle. The cylinder-head assembly shall be removed from the extinguisher. Any indication of contact between the puncture pin and the frangible safety disk, or any deformation of cylinder-head assembly, the carry handle, carrying handle attaching pins, or actuating lever shall constitute failure of this test.

## 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor

## MIL-DTL-52031E

personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The hand held fire extinguisher is intended to be used to combat incipient petroleum electric fires.

6.2 Acquisition requirement. Acquisition documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Packaging requirements (see 5.1).
- (c) When first article inspection is required (see 3.2)
- (d) Degree of preservation and degree of packing required (see 5.1).

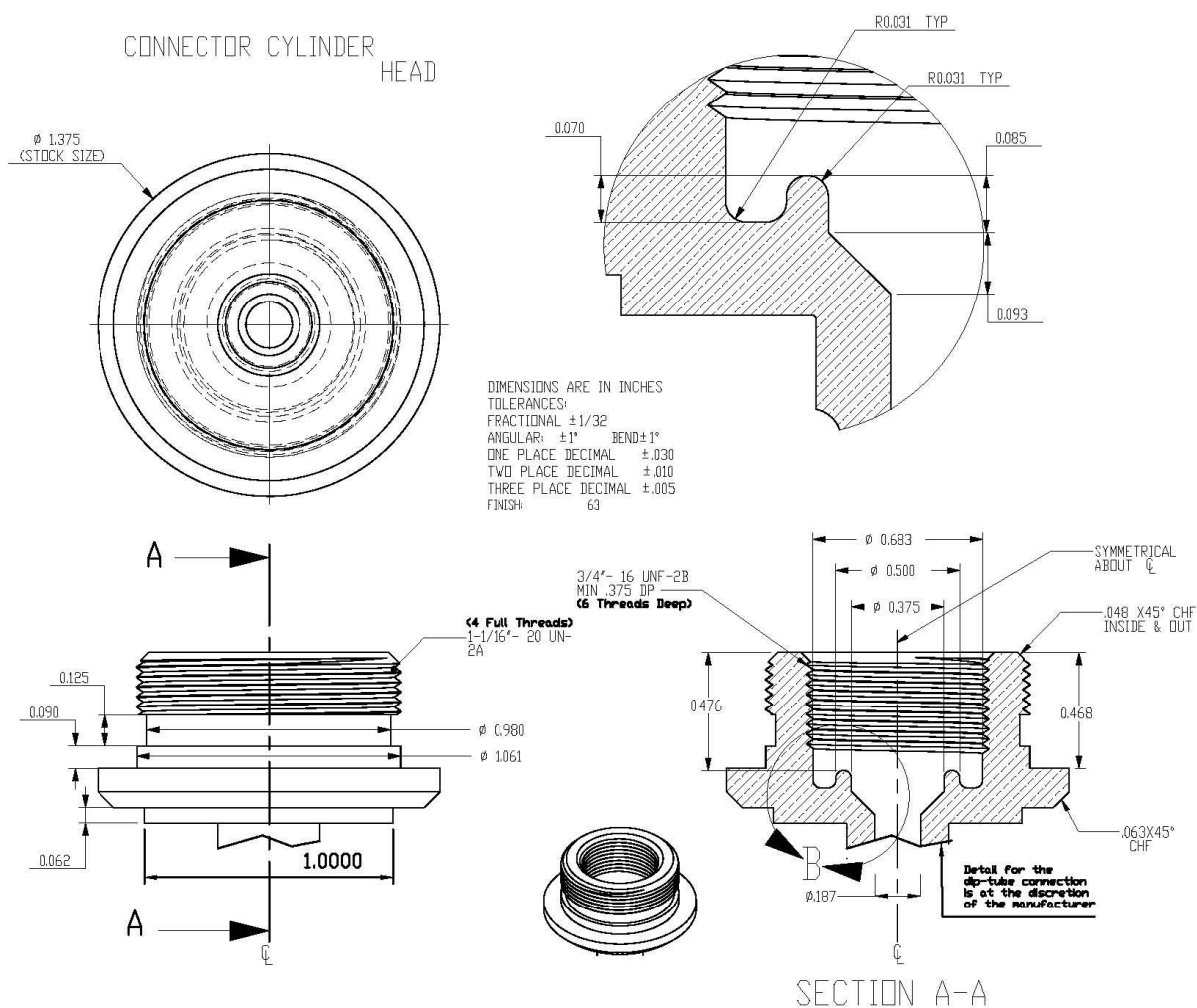
6.4 Recycled material. The use of recycled materials which meet the requirements of this specification is encouraged (see 3.3).

### 6.5 Key Word Listing

Nitrogen  
Non Refillable  
Pressurized  
Strain  
Vibrations

6.6. Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

## MIL-DTL-52031E

FIGURE 1. Cylinder head connection

MIL-DTL-52031E

NOTE: TEST 2 OF EVERY 3000 ASSEMBLIES FOR RUPTURE.  
REQUIRED RUPTURE PRESSURE 950-1150 PSI.

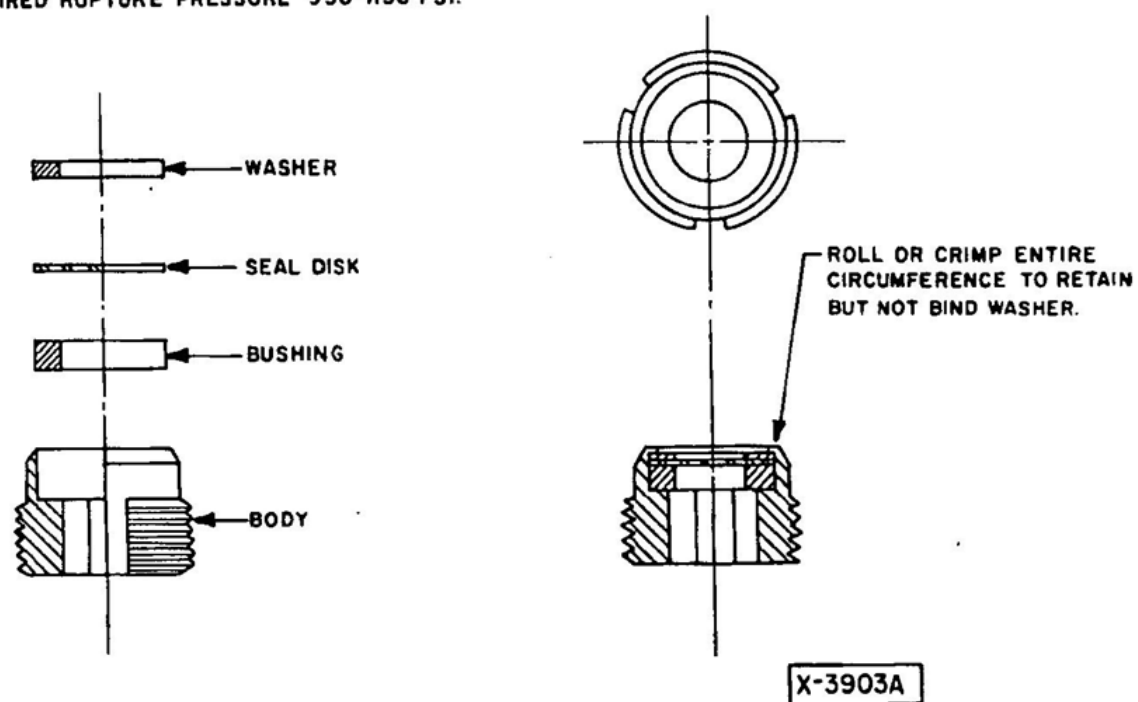
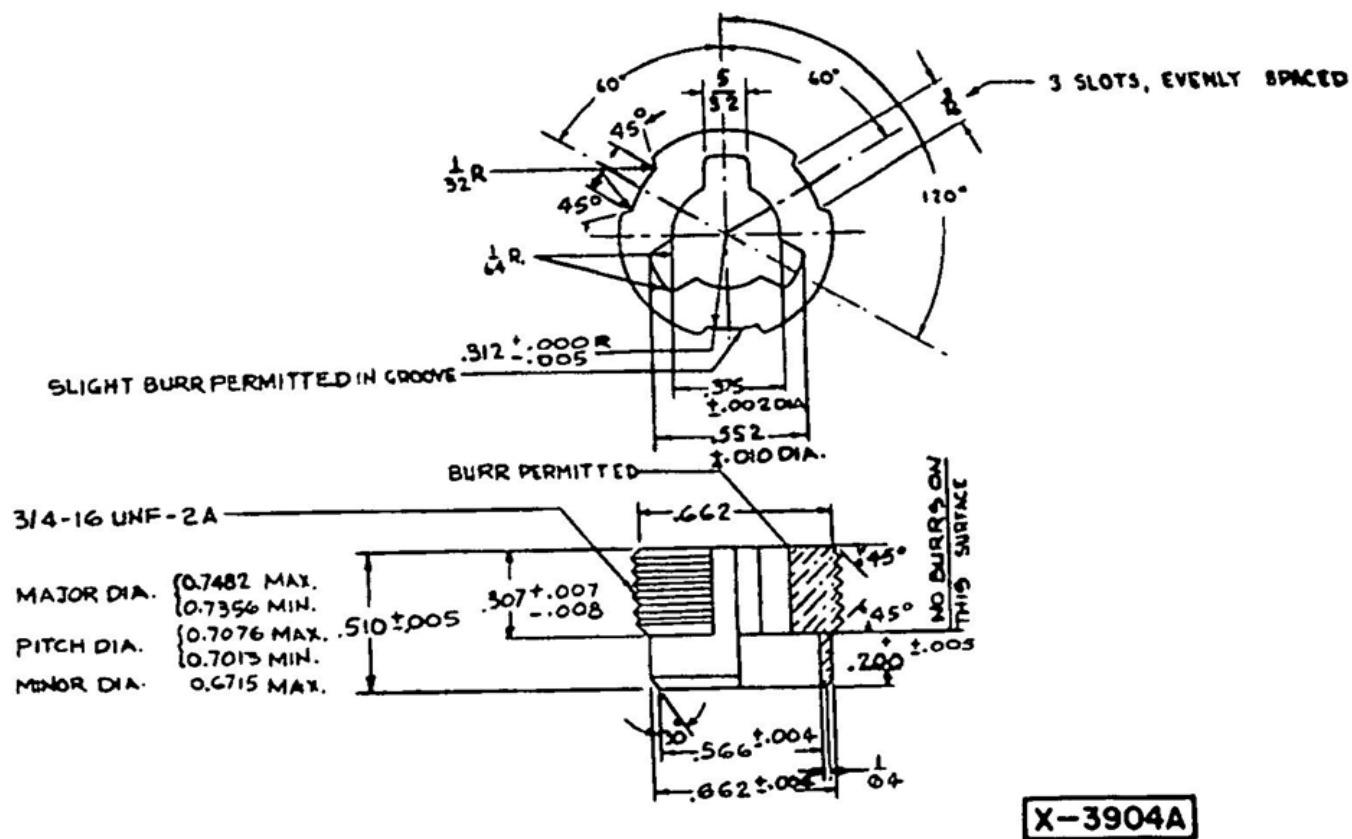
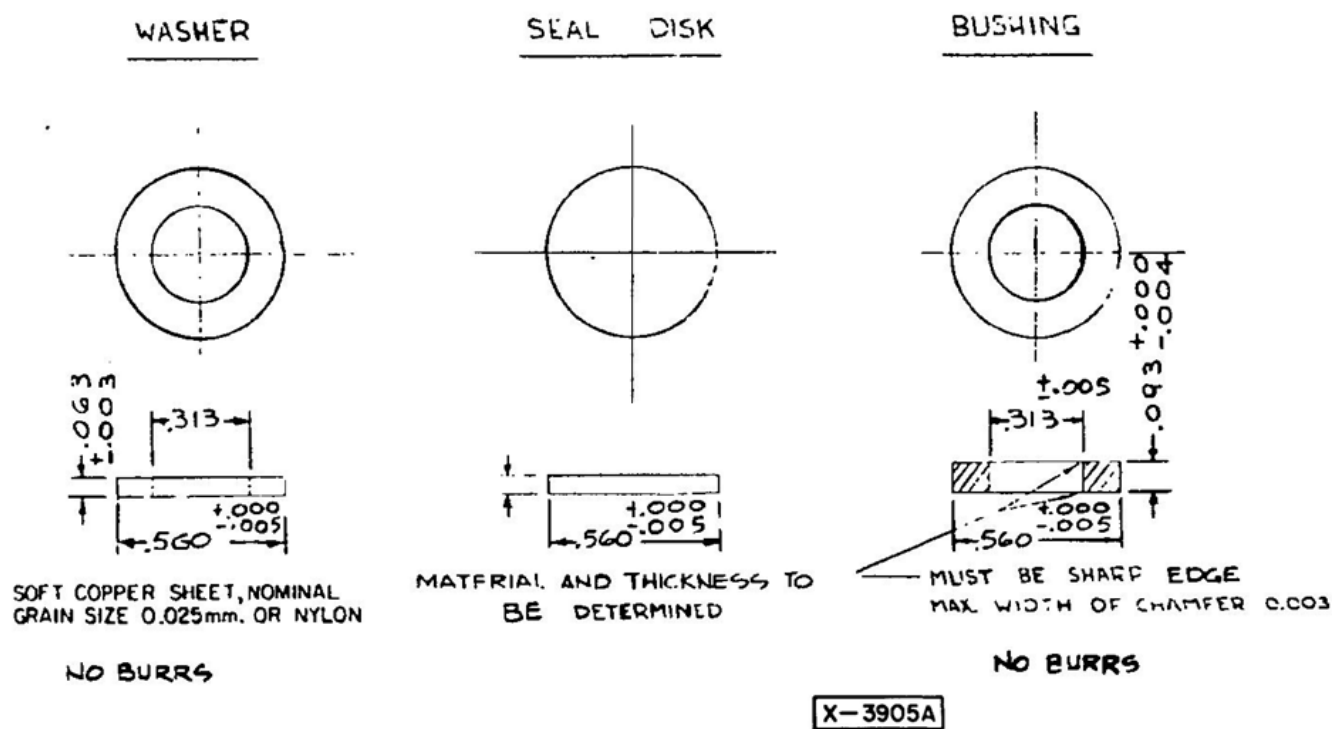


FIGURE 2. Cylinder seal assembly

MIL-DTL-52031E

FIGURE 3. Cylinder seal details - body

MIL-DTL-52031E

FIGURE 4. Cylinder seal details – washer, seal disk, and bushing



MIL-DTL-52031E

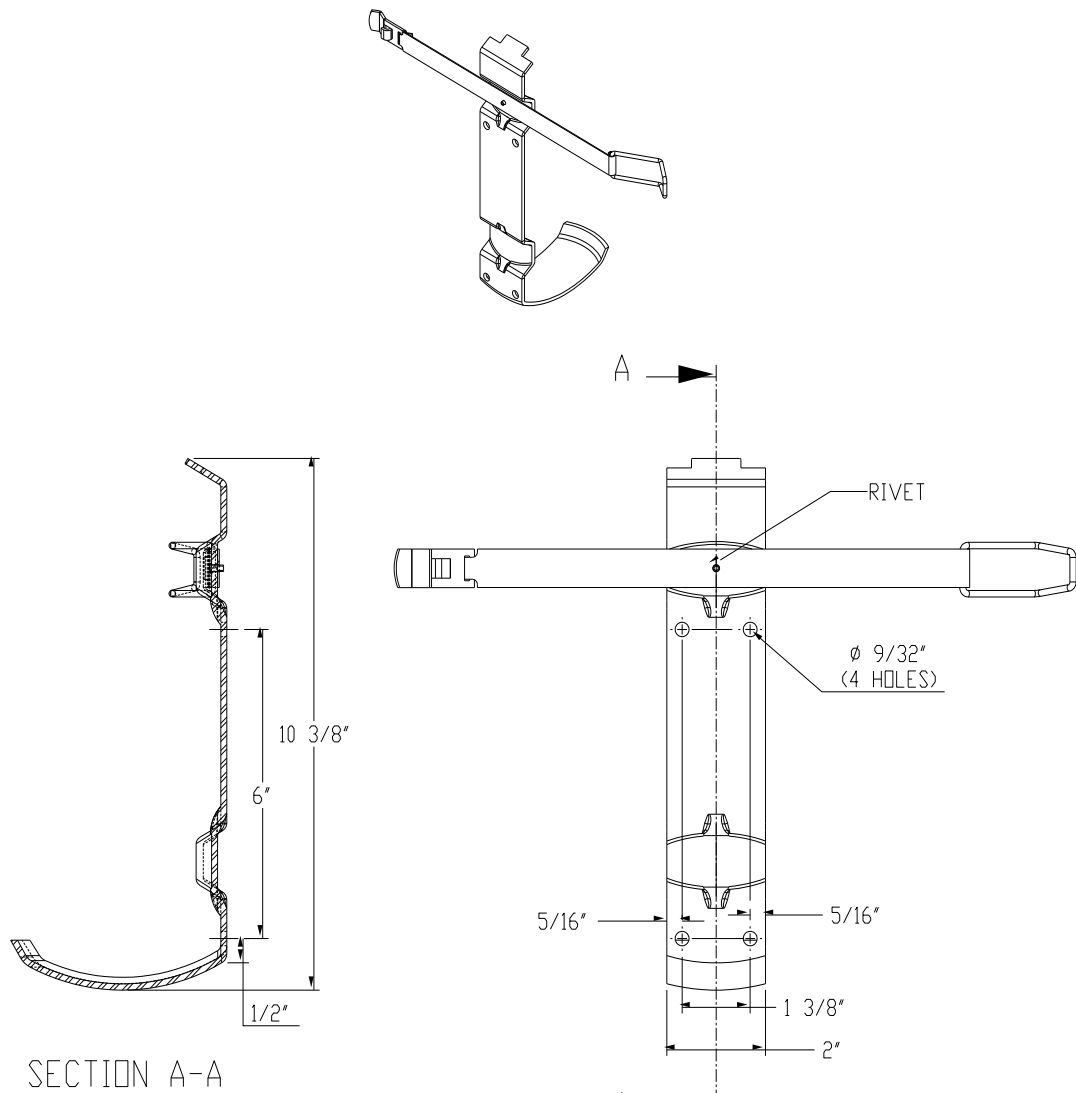


FIGURE 5. Bracket for hand-held fire extinguisher

MIL-DTL-52031E

Custodian:

Army – AV  
Navy – AS  
Air Force -99

Preparing activity:

Army – AV  
(Project Nr 4210-2009-022)

Review activities:

Army – MI  
Air Force -84  
DLA – GS

NOTE; The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <http://assist.daps.dla.mil>