SAE INTERNATIONAL

AEROSPACE STANDARD

AS245 REV. C

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Superseding AS245B

(R) Water Solution Type Hand Fire Extinguisher

RATIONALE

This revision updates the qualification testing requirements to current industry standards and clarifies the use of the mandating and recommending words “Shall” and “Should”. Other format and editorial changes are intended to bring this standard up to date with current SAE aerospace report standards.

1. SCOPE

This specification covers the following types and classes of extinguishers:

Type I Stored pressure type

Category A - Operational Temperature range -40 to +140 °F (-40 to +60 °C)

Category B - Operational Temperature range +35 to +140 °F (+1.7 to +60 °C)

Type II Cartridge operated type

Category A - Operational Temperature range -40 to +140 °F (-40 to +60 °C)

Category B - Operational Temperature range +35 to +140 °F (+1.7 to +60 °C)

1.1 Purpose

The purpose of this AS is to specify minimum requirements for a water solution type hand fire extinguisher that shall be suitable for use on incipient fires which may occur in an airplane cabin interior. The type of fire for which these units are intended is one involving solid combustible materials such as paper, textiles and similar materials.

The goal of this standard is to provide fire extinguishers that have the physical attributes necessary to assure the airworthiness necessary for installation on aircraft type certificated under FAA/EASA regulations (14CFR/CS part 23, 25, 27, or 29, as applicable).

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http://www.sae.org/technical/standards/AS245C

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the publication date of this standard. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations, unless a specific exemption has been obtained.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org

AS6011 Cylinders, Carbon Dioxide Filled, Technical

2.1.2 RTCA Publications

Available from RTCA, Inc., 1150 18th Street, NW, Suite 910, Washington, DC 20036, Tel: 202-833-9339, www.rtca.org.

RTCA DO-160G Environmental Conditions and Test Procedures for Airborne Equipment

2.1.3 U.S. Government Publications

Available from DLA Document Services, Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6396, http://quicksearch.dla.mil/.

MIL-PRF-6164G Valve: Aircraft, Pneumatic, High-Pressure Charging

MIL-C-5499B Cores: Aircraft High-Pressure Air Valve

AN 6287 Valve - Air High-Pressure

2.2 Related Publications

The following publications are provided for information purposes and are not a required part of this SAE Aerospace Standard.

2.2.1 Code of Federal Regulations

Available from the United States Government Printing Office, 732 North Capitol Street, NW, Washington, DC 20401, Tel: 202-512-1800, www.gpo.gov.

14 CFR 23 Airworthiness Standards: Normal, Utility, Acrobatic and Commuter Category Airplanes

14 CFR 25 Airworthiness Standards: Transport Category Airplanes

14 CFR 27 Airworthiness Standards: Normal Category Rotorcraft

14 CFR 29 Airworthiness Standards: Transport Category Rotorcraft

2.2.2 EASA Publications

Available from European Aviation Safety Agency, Postfach 10 12 53, D-50452 Cologne, Germany, Tel: +49-221-8999-000, www.easa.eu.int.

CS-23 Certification Specifications for Normal, Utility, Aerobatic and Commuter Category Aeroplanes

CS-25 Certification Specifications and Acceptable Means of Compliance for Large Aeroplanes

CS-27 Certification Specifications for Small Rotorcraft

CS-29 Certification Specifications for Large Rotorcraft

2.2.3 FAA Publications

Available from Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, Tel: 866-835-5322, www.faa.gov.

Hand Fire Extinguishers for Use in Aircraft, Advisory Circular (AC) 20-42D, January 14, 2011

2.2.4 NFPA Publications

Available from NFPA, 1 Batterymarch Park, Quincy, MA 02169-7471, Tel: 617-770-3000, www.nfpa.org.

Aircraft Hand Portable Fire Extinguishers, NFPA 408, 2010

2.3 Definitions

2.3.1 CLASS A FIRE

A fire consisting of all solid materials (e.g., wood, textiles, curtains furniture and plastics, etc.), usually organic in nature (contains compounds of carbon), which generally produce glowing embers.

2.3.2 WETTING AGENT

A chemical agent that allows a liquid to spread more easily across or into a surface by lowering the liquid's surface tension.

2.4 Mandating and Recommending Words

SHALL: Indicates a mandatory criterion.

SHOULD: Indicates a criterion for which an alternative, including noncompliance, may be applied if it is documented and justified.

3. GENERAL REQUIREMENTS

3.1 Fire Type

The fire extinguisher shall be shown to be effective against an incipient Class A Fire.

3.2 Materials and Workmanship

3.2.1 Materials

Materials shall be of a quality which experience or tests have demonstrated to be suitable and dependable for use in aircraft equipment manufacturing practice.

3.2.2 Workmanship

Workmanship shall be consistent with high-grade aircraft equipment manufacturing practice.

3.3 Identification

The following information shall be legibly and permanently marked on the extinguisher:

a. Name of extinguisher.

b. SAE Aeronautical Standard AS245C, Type ___, Category ___.

c. Capacity.

d. Test pressure of container.

e. Manufacturer’s Part or Model Number.

f. Manufacturer’s Name and/or Trade Mark.

g. Operating and Maintenance instructions.

h. Category "B" units shall be marked "Protect from freezing".

3.4 Environmental Conditions

The fire extinguisher shall be capable of normal operational use during and/or subsequent to exposure to the following environmental conditions. The specific qualification test requirements related to these environmental conditions are identified in Section 6.

3.4.1 Temperature

The fire extinguisher shall function and not be adversely affected when subjected to the following extreme operating and ground survival temperatures

3.4.1.1 Category A Operating Temperature Range

-40 °F (-40 °C) to +140 °F (+60 °C)

3.4.1.2 Category A Ground Survival Temperature Range

-67 °F (-55 °C) to +185 °F (+85 °C)

3.4.1.3 Category B Operating Temperature Range

+35 °F (+1.7 °C) to +140 °F (+60 °C)

3.4.1.4 Category B Ground Survival Temperature Range

+35 °F (+1.7 °C) to +185 °F (+85 °C)

3.4.2 Altitude

The extinguisher shall function and performance shall not be adversely affected when subjected to pressure in the range equivalent to -1000 feet (-304.8 m) to +40 000 feet (12 192 m).

3.4.3 Humidity

The fire extinguisher shall function and shall not be adversely affected when exposed to a humid environment.

3.4.4 Vibration

The fire extinguisher, installed in its mounting bracket, shall function and shall not be adversely affected by prolonged exposure to vibration.

3.4.5 Fungus

The fire extinguishers shall be constructed of materials that do not support fungus growth.

4. DETAIL REQUIREMENTS

4.1 Design

4.1.1 The extinguisher shall consist of:

Type I - A container having a dischargeable capacity of at least 1-3/8 quarts (1.3 L), a connection for pressurizing the unit and a means of controlling the discharge of the liquid content.

Type II - A container having a dischargeable capacity of at least 1-3/8 quarts (1.3 L), a suitable holder and releasing means for the cartridge, and a means of controlling the discharge of the liquid content.

4.1.2 The container shall be designed for a minimum burst pressure of 500 psig (3447 kPa).

4.1.3 The Type I unit shall be fitted with an AN connection in accordance with MIL-PRF-6164G or equivalent, for pressurizing the unit. A pressure gage to indicate the stored pressure shall also be provided. The gage range shall be at least 100 psig (689 kPa) above the charged pressure of the unit at +70 °F (+21 °C).

4.1.4 Type II units shall use as a pressurizing means a carbon dioxide filled cartridge made in accordance with AS6011 or equivalent, and in addition, shall be suitably winterized to insure proper operation. A means shall be provided to readily release the carbon dioxide from the cartridge immediately prior to the use of the unit. The torque required to release the cartridge shall not exceed 15 inch-pounds (17.28 kg-cm) and the releasing device shall have a minimum diameter of 1 inch (2.54 cm). The cartridge holder shall be designed so that it cannot be assembled if the cartridge is in the wrong position. The cartridge holder shall be designed so that a simple visual inspection will indicate whether a cartridge is in the holder.

4.1.5 The extinguisher shall be provided with a valve, which will control the liquid discharge. The extinguisher shall be designed so that after the unit has been placed in operation it shall be completely controllable with one hand, including starting, stopping and directing the discharge stream. The force to operate the valve shall not exceed 3 pounds (1.36 kg) if the lever type is used. If a rotary type is used, the torque required shall not exceed 15 inch-pounds and the releasing device shall have a minimum diameter of 1 inch (2.54 cm). For Type II extinguishers, with the unit mounted in its bracket, it shall not be possible to operate the valve controlling the discharge.

4.1.6 Type II units shall be designed so that the maximum stored pressure at +70 °F (+21 °C) when the cartridge is released into a filled unit shall not exceed 200 psig (1379 kPa).

4.1.7 The extinguisher shall be designed so that it cannot be overfilled with extinguisher medium.

4.1.8 The extinguisher shall be provided with a satisfactory seal to indicate tampering and/or operation.

4.2 Liquid Charge

4.2.1 The liquid used with either Category "A" or Category "B" extinguishers shall be a water base solution suitable for service over the temperature range for the category intended.

4.2.2 The liquid used as the extinguishing medium shall be as free from corrosive effects as practicable and shall not adversely affect the operating mechanism of the extinguisher.

4.2.3 The fire extinguishing liquid shall be essentially non-toxic and non-injurious to personnel and shall not form injurious toxic fumes when discharged on a fire.

4.2.4 The fire extinguishing liquid shall not deteriorate or lose its efficiency over a 1 year period.

4.2.5 The fire extinguishing liquid shall have extinguishing qualities equal to or better than an equal quantity of water when used at +70 °F (+21 °C).

4.2.6 A wetting agent may be used provided the resulting solution complies with all requirements of the specification.

4.3 Discharge Characteristics

4.3.1 At +70 °F (+21 °C) the time of effective discharge for a full extinguisher shall not be less than 30 nor more than 45 seconds.

4.3.2 At +70 °F (+21 °C), with the extinguisher nozzle approximately 4 feet (1.2 m) above the floor, it shall throw a stream a horizontal distance of not less than 12 feet (3.65 m) and maintain this range for at least three-quarters of the contents.

4.3.3 The extinguisher at +70 °F (+21 °C) shall be capable of discharging three-quarters of its contents by directing the stream in any desired direction.

4.3.4 The discharge tests shall be conducted using the appropriate liquid charge for the extinguisher.

4.4 Mounting Bracket

4.4.1 A mounting bracket shall be furnished from which the fire extinguisher can be quickly and easily removed.

4.4.2 The mounting bracket shall be designed to retain the charged fire extinguisher against an acceleration force of 10 g applied in any direction.

4.4.3 The mounting bracket shall permit, without removal of the fire extinguisher from its bracket, inspection of fire extinguisher gauges and/or other operational status indicators.