



Department of Transportation
Federal Aviation Administration
Aircraft Certification Service
Washington, D.C.

TSO-C19c

Effective
Date: 02/26/09

Technical Standard Order

Subject: Portable Water Solution Type Hand Fire Extinguisher

1. **PURPOSE.** This technical standard order (TSO) is for manufacturers applying for a TSO authorization (TSOA) or letter of design approval (LODA). In it, we (the Federal Aviation Administration, or FAA) tell you what minimum performance standards (MPS) your portable water solution type hand fire extinguisher must first meet for approval and identification with the applicable TSO marking.

2. **APPLICABILITY.** This TSO affects new applications submitted after its effective date.

a. All prior revisions to this TSO are no longer effective. Generally we will not accept applications after the effective date of this TSO. However, we may do so up to six months after it, if we know that you were working against the earlier MPS before the new change became effective.

b. Portable water solution type hand fire extinguishers approved under a previous TSOA or LODA may still be manufactured under the provisions of their original approval.

c. Major design changes to portable water solution type hand fire extinguishers approved under this TSO will require a new authorization. See Title 14 of the Code of Federal Regulations (14 CFR) 21.611(b).

3. **REQUIREMENTS.**

a. New models of portable water solution type hand fire extinguishers identified and manufactured on or after the effective date of this TSO must meet the MPS qualification and documentation requirements in SAE International's Aerospace Standard (AS) 245B, *Water Solution Type Hand Fire Extinguisher*, dated (revised) April 2004, as modified in appendix 1 of this TSO.

b. Portable water solution type hand fire extinguishers are separated into two types and categories:

Type I: Stored pressure

Category A - Temperature range -40° F to +140° F

Category B - Temperature range +35° F to +140° F

Type II: Cartridge operated

Category A - Temperature range -40° F to +140° F

Category B - Temperature range +35° F to +140° F

c. Functionality. This TSO's standards apply to portable water solution type hand fire extinguisher for use on fires in an aircraft cabin interior. These units are intended to combat fires involving combustible materials like paper and textiles. Units are also suitable for controlling fires involving a small number of rechargeable lithium batteries found in portable electronic devices (PED).

d. Environmental Qualification. Test the equipment according to procedures in AS245B, paragraphs 5 and 6.

e. Deviations. We have provisions for using alternate or equivalent means of compliance to the criteria in the MPS of this TSO. If you invoke these provisions, you must show that your equipment maintains an equivalent level of safety. Apply for a deviation under 14 CFR 21.609 before submitting your data package.

4. MARKING.

a. Mark at least one major component permanently and legibly with all the information in 14 CFR 21.607(d), except for the following:

(1) 14 CFR 21.607(d)(2). Use the name, type, and part number. Do not use the optional model number; and

(2) 14 CFR 21.607(d)(3). Use the date of manufacture. Do not use the optional serial number.

b. In addition, permanently and legibly mark the extinguisher with the following:

(1) Type and category (see paragraph 3 above.)

(2) Capacity.

(3) Test pressure of container.

(4) Operating and maintenance instructions.

(5) The words "Protect from freezing" for category B units.

c. Also, mark the following permanently and legibly, with at least the manufacturer's name, subassembly part number, and the TSO number:

- (1) Each component that is easily removable (without hand tools),
- (2) Each interchangeable element, and
- (3) Each subassembly of the article that you determined may be interchangeable.

d. Identifying deviations granted to the article by marking "Deviation. See installation/instruction manual (IM)" after the TSO number. You can abbreviate the marking to "(Dev. See IM)."

e. Optional marking is permitted to allow aircraft- or operational-specific installation limitations, such as: "FOR USE ON *{insert aircraft type or serial number}* ONLY," "FOR USE ON AIRCRAFT USED IN PART *{insert number}* OPERATIONS ONLY," "FOR MILIARY USE ONLY," or "SEE DRAWING NO. *{insert number}* FOR INSTALLATION LIMITATIONS."

5. APPLICATION DATA REQUIREMENTS. As a TSO manufacturer-applicant, you must give the FAA aircraft certification office (ACO) manager responsible for your facilities a statement of conformance, as specified 14 CFR 21.605(a)(1) and one copy each of the following technical data to support your design and production approval. (Under 14 CFR 21.617(a)(2), LODA applicants submit the same data through their civil aviation authority:)

a. Operating instructions and equipment limitations in an IM, sufficient to describe the equipment's operational capability. Describe any deviations in detail. If needed, identify equipment by part number, version, revision, and criticality level of software/hardware, classification for use, and environmental categories.

b. Installation procedures and limitations in an IM, sufficient to ensure that the portable water solution type hand fire extinguisher, when installed according to the installation procedures, still meets this TSO's requirements. Limitations must identify any unique aspects of the installation. Finally, the limitations must include a note with the following statement:

The conditions and tests for TSO approval of this article are minimum performance standards. Those installing this article, on or in a specific type or class of aircraft, must determine that the aircraft installation conditions are within the TSO standards. TSO articles must have separate approval for installation in an aircraft. The article may be installed only according to 14 CFR part 43 or the applicable airworthiness requirements.

c. Schematic drawings of the installation procedures.

- d. Wiring diagrams of the installation procedures.
 - e. List of components, by part number, that make up the portable water solution type hand fire extinguisher complying with the standards prescribed under this TSO. Include vendor part number cross-references, when applicable.
 - f. A component maintenance manual (CMM), covering periodic maintenance, calibration, and repair, for the continued airworthiness of installed passenger oxygen mask assembly, continuous flow. Include recommended inspection intervals and service life. Describe the details of deviations granted, as noted in paragraph **5.a** of this TSO.
 - g. Material and process specifications list.
 - h. The quality control system (QCS) description required by 14 CFR §§ 21.143 and 21.605(a)(3), including functional test specifications. The QCS should ensure that you will detect any change to the equipment that could adversely affect compliance with the TSO MPS, and reject the item accordingly. (Not required for LODA applicants.)
 - i. Manufacturer's TSO qualification test report.
 - j. Nameplate drawing with the information required by paragraph **4** of this TSO.
 - k. List of all drawings and processes (including revision level) that define the article's design. For a minor change, follow the directions in 14 CFR 21.611(a). Show any revisions to the drawing list only on our request.
- 6. MANUFACTURER DATA REQUIREMENTS.** Besides the data given directly to us, have the following technical data available for review by the responsible ACO or civil aviation authority:
- a. Functional qualification specifications for qualifying each production article to ensure compliance with this TSO.
 - b. Equipment calibration procedures.
 - c. Corrective maintenance procedures within 12 months after TSOA or LODA.
 - d. Schematic drawings.
 - e. Wiring diagrams.
 - f. Material and process specifications.
 - g. Results of the environmental qualification tests conducted per paragraph **3.d** of this TSO.

7. FURNISHED DATA REQUIREMENTS. If furnishing one or more articles manufactured under this TSO to one entity (such as an operator or repair station), provide one copy of the data in paragraphs **5.a** through **5.f** of this TSO. Add any other data needed for the proper installation, certification, use, or for continued airworthiness, of the portable water solution type hand fire extinguisher.

8. HOW TO GET REFERENCED DOCUMENTS.

a. Order SAE documents from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001. Telephone (724) 776-4970, fax (724) 776-0790. You can also order copies online at www.sae.org.

b. Order copies of 14 CFR part 21, Subpart O and part 25, from the Superintendent of Documents, Government Printing Office, P.O. Box 37154, Pittsburgh PA 15250-7954. Telephone (202) 512-1800, fax (202) 512-2250. You can also order copies online at www.access.gpo.gov. Select "Access," then "Online Bookstore." Select "Aviation," then "Code of Federal Regulations."

c. You can find a current list of technical standard orders and advisory circulars on the FAA Internet website Regulatory and Guidance Library at <http://rgl.faa.gov>. You will also find the TSO Index of Articles at the same site.

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**APPENDIX 1. MPS FOR PORTABLE WATER SOLUTION TYPE HAND FIRE
EXTINGUISHERS**

The applicable standard is SAE AS245B, *Water Solution Type Hand Fire Extinguisher*, dated (revised) April 2004. We modified it as follows:

<i>SAE AS245B citation:</i>	<i>FAA modification:</i>
Section 1. Scope:	Disregard. Find types and category requirements in paragraph 3.b of this TSO.
Paragraph 1.1. Purpose:	Disregard. Find purpose and functionality requirements in paragraph 3.c of this TSO.
Section 2. References:	Add the following references: NFPA-408 NFPA-410 14 CFR 178.44
Paragraph 3.2. Identification:	Disregard. Find marking requirements in paragraph 4 of this TSO.
Paragraph 5. Individual Performance Requirements:	Revise to read as follows: Subject all extinguishers, or extinguisher components, to the following test, at a minimum.