

Revised ICAO Fire Test Method

ICAO Doc 9137 – AN/898 Airport Services Manual Part 1
Rescue and Fire Fighting, Chapter 8

Changes with effect from 15 July 2013, applicable 14 November 2013

NOTES ON THE PRESENTATION OF THE PROPOSED REVISION

The text of the revision is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~ text to be deleted
 2. **New text to be inserted is highlighted with grey shading.** new text to be inserted
 3. ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading. new text to replace existing text
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8.1.4 Where States or individual users do not have the facilities for conducting the tests which will establish the specified properties and performances, certification of the qualification of a concentrate should be obtained from ~~the manufacturer or supplier, based on the local operating conditions~~ a recognized, accredited third party testing authority.

8.1.8 Fire test method

Objective: To evaluate the ability of a foam concentrate to:

- a) extinguish a fire of: 2.8 m^2 , - Performance Level **A**
 4.5 m^2 , - Performance Level **B**
 7.32 m^2 , - performance Level **C** as appropriate;
- b) resist burn back due to exposure to fuel and heat.

Equipment:

- a) **A** circular fire steel tray of: 2.8 m^2 – Performance Level **A**
 4.5 m^2 – Performance Level **B**
 7.32 m^2 – Performance Level **C**

The vertical wall shall be **200** mm;

- b) Equipment or access to facilities to enable accurate recordings of:
 - 1) air temperature;
 - 2) water temperature; and
 - 3) wind velocity;

- c) Fuel: 60 L of Avtur (Jet A) for performance level **A** tests;
100 L of Avtur (Jet A) for performance level **B** tests;
157 L of Avtur (Jet A) for performance level **C** tests.
- d) Branch pipe, straight stream, air aspirating nozzle;
- e) Suitable stop watch; and
- f) Circular, burn back pot, measuring 300 mm (internal diameter), 200 mm high, 2 L of gasoline or kerosene.
- g) Protective screen between tray and equipment, for protection against radiant heat, is acceptable.

Preferable Testing conditions:

- a) Air temperature (EC) $\geq 15\text{C}$
- b) Foam solution temperature (EC) $\geq 1.5\text{C}$
- c) Wind velocity (m/s) ≤ 3
- d) The test shall not be carried out in conditions of precipitation, if outdoors.

Table 8-1

Fire Tests	Performance Level A	Performance Level B	Performance Level C
Nozzle (Air Aspirated)			
a) Branch pipe	"Uni 86" Foam nozzle (See Appendix 3)	"Uni 86" Foam nozzle (See Appendix 3)	"Uni 86" Foam nozzle (See Appendix 3)
b) Nozzle pressure	700 kPa	700 kPa	700 kPa
c) Application rate	4.1 l/min/m ²	2.5 l/min/m ²	1.75 l/min/m ²
d) Nozzle Discharge rate	11.4 l/min	11.4 l/min	11.4 l/min
Fire size	≈ 2.8 m ² (circular)	≈ 4.5 m ² (circular)	≈ 7.32 m ² (circular)
Fuel (on water substrate)	Kerosene	Kerosene	Kerosene
Preburn time	60 s	60 s	60 s
Fire performance			
a) extinguishing time	≤ 60 s	≤ 60 s	≤ 60 s
b) total application time	120 s	120 s	120 s
c) 25% reignition time	≥ 5 min	≥ 5 min	≥ 5 min

Test procedure

- Position the chamber holding the premix foam upwind of the fire with the nozzle horizontal at a height of 1 m above the upper edge of the tray and at a distance that will ensure that the foam will fall into the centre of the tray. The branch pipe may be moved on a horizontal plane during the test.

- Test the foam apparatus to ensure:

- a) nozzle pressure; and
- b) discharge rate.

- When testing performance level A foam, place 60 L of water and 60 L of fuel into a 2.8 m² tray.
- When testing performance level B foam, place 100 L of water and 100 L of fuel into a 4.5 m² tray.
- When testing performance level C foam, place 157 L of water and 157 L of fuel into a 7.32 m² tray.
- Position the protective screen, if required
- Test the foam apparatus to ensure a nozzle pressure of approximately 6.3 – 6.6 bar and a discharge rate of 11.4 l/min
- Record the air, kerosene, water and foam premix temperature and check it is in the correct range
- Record the wind velocity and check it is in the correct range
- Ignite fuel and allow 60 seconds preburn from full involvement.
 - Note 1: full involvement shall be obtained in less than 30 seconds after the beginning of ignition
 - Note 2: ignition method shall forbid putting solid or liquid substance into the kerosene, for example ignition with a gas burner is acceptable.
- Apply foam continuously while maintaining the nozzle pressure and an application rate of 11.4 l/min for 120 seconds.
- Record extinction time.
- Place burn back pot in centre of fire tray.
- Ignite burn back pot 120 seconds after end of application of foam.
- Record when 25 per cent of the fuel area is re-involved with fire.

Fire fighting performance requirements

For each performance level, a foam concentrate is acceptable:

- If the time to extinguish the fire from the overall surface of the tray is equal or less than 60 seconds and;
- The re-ignition of 25% of the tray surface is equal or longer than 5 minutes.

Note for testing authorities: At the 60 seconds time, minute flames (flickers) visible between the foam blanket and the inner edge of the tray are acceptable:

- If they don't spread in a cumulative length exceeding 25% of the circumference of the inner edge of the tray and;
- They are totally extinguished during the second minute of foam application.

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