
**Ships and marine technology —
External firefighting system test
methods**

*Navires et technologie maritime — Méthodes d'essai des systèmes de
lutte contre les incendies extérieurs*

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 1, *Maritime safety*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The purpose of this document is to provide a standard for test methods, relevant procedures, and the inspection process of marine external firefighting systems. Moreover, it includes procedures to comprehensively verify the correctness of the installations and the integrity of the external firefighting systems, in order to ensure that the main functions and performance indices of the system meet the specified requirements.

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Ships and marine technology — External firefighting system test methods

1 Scope

This document specifies the test methods for marine external firefighting systems after installation aboard, mainly including test preparation, test conditions, test apparatus and procedures. This document excludes the performance requirements of the equipment.

This document is applicable to the testing of external firefighting systems installed on ships for the purpose of extinguishing fires occurring on other vessels, offshore structures or quayside structures.

This document applies to marine external firefighting system with water or foam as the medium.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

3.1

external firefighting system

system installed on ships for the purpose of extinguishing fires occurring on other vessels, offshore installation or quayside structures

Note 1 to entry: In general, the system consists of a fire pump, foam pump, fire monitor, foam proportioner, *power source* (3.2), *telescopic mast* (3.5) (if configured), control console, valve accessories and pipeline.

3.2

power source

prime mover which provides driving power for the fire pump

3.3

water curtain system

fixed system that provides protection of the ship on which the system is installed against external heat radiation by water spray

3.4

fire monitor

device for continuously spraying a fire extinguishing agent, where water or foam mixture is greater than 16 l/s, and which is provided by fire pumps and *foam pumps* (3.9) to supply a fire extinguishing agent

3.5

telescopic mast

fixed platform for a *fire monitor* (3.4) installation, driven by power, and which can position the *fire monitor* (3.4) to a certain height

3.6

foam concentrate

foam liquid that, when mixed with water in the appropriate concentration, gives a *foam solution* (3.7)

[SOURCE: ISO 7203-1:2019, 3.8, modified — “foam” added before “concentrate” in the term, and before “liquid” in the definition.]

3.7

foam solution

solution of *foam concentrate* (3.6) and water

[SOURCE: ISO 7203-1:2019, 3.15]

3.8

foam proportioner

device which can automatically control the mixing ratio within a certain range of water pressure and flow

3.9

foam pump

pump that supplies *foam concentrate* (3.6) to a foam system

3.10

length of throw of the fire monitor

distance measured horizontally from the monitor outlet to the mean impact area of water spray

Note 1 to entry: The mean impact area of water spray is measured for not less than 10 s. The *fire monitor* (3.4) outlet end face is measured when the *fire monitor* (3.4) is spraying under specified conditions.

4 Test preparation

4.1 Documents used in the test

The documents required to conduct the test are as follows:

- a) schematic diagram of the external firefighting system;
- b) layout of the external firefighting system;
- c) layout of the water curtain system;
- d) installation drawing and related technical documents of the external firefighting system equipment;
- e) electrical control schematic diagram of the external firefighting system;
- f) layout of the external firefighting system electrical equipment;
- g) system operation instructions, ex-factory test documents;
- h) system equipment test programme.

4.2 Instruments and tools for the test

The instruments and tools required to conduct the test are as follows:

- a) anemometer having an accuracy of 0,5 m/s;

NOTE See ISO 10596:2009, 7.2.

- b) pressure gauge;

- c) vacuum gauge;
- d) megohmmeter;
- e) ammeter;
- f) voltmeter;
- g) range finder;
- h) stopwatch having an accuracy of 0,1 s;
- i) thermometer having an accuracy of 1 °C;
- j) goniometer having an accuracy of 1 degree.

Other instrumentation shall be accurate to within the limits as follows:

- k) pressure: ± 1 % of the value to measure;
- l) length: ± 1 % of the value to measure;
- m) electrical resistance: $\pm 1,5$ % of the actual measurement;
- n) voltage: $\pm 1,5$ % of the actual measurement;
- o) electric current: $\pm 1,5$ % of the actual measurement.

5 Test conditions

5.1 The external firefighting system shall be installed on board a ship and shall be in fully operating conditions.

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5.2 When measuring the length of throw of the fire monitor, the wind speed shall not be greater than 3 m/s and the fire monitor spray should be along the wind direction.

5.3 There shall be enough operation space around the fire monitor. There shall be no obstacles in the hull that affect the spray range of the fire monitor.

5.4 There shall be no vessels within the range of the fire monitor.

6 Test items and procedures

6.1 Test items

The following tests shall be conducted:

- a) insulation resistance test of electrical equipment;
- b) operation test of electric valve;
- c) operation test of fire monitor;
- d) test of control and alarm system;
- e) test of fire pump;
- f) test of fire monitor;
- g) test of foam fire extinguishing system;

- h) test of telescopic mast;
- i) test of water curtain system and fire hydrant.

6.2 Insulation resistance test of electrical equipment

Measure the insulation resistance of each electrical equipment of the system before and after the test. The minimum value of the insulation resistance shall not be less than 1 MΩ.

6.3 Operation test of electric valve

6.3.1 Electric valves shall be opened and closed by manual and remote control, respectively. The valve movements shall be smooth and free of jamming, the valve open/close position shall be indicated correctly. The operating current and voltage of each electric valve shall be measured. The test shall be conducted while the fire pump is stopped.

6.3.2 Combined with other tests of the external firefighting system, while the fire pump is running, the electric valve shall be opened and closed by remote control. The valve movements shall be smooth and free of jamming, the valve open/close position shall be indicated correctly.

6.4 Operation test of fire monitor

6.4.1 Static control test of fire monitor

6.4.1.1 The test shall be conducted while the fire pump is stopped.

6.4.1.2 Each fire monitor shall be respectively operated by console, portable controller and local manual control mode. The pitching rotation mechanism, horizontal rotation mechanism and the local control hand wheel of each fire monitor shall be operated smoothly without jamming, and the transmission mechanism shall be safe and reliable. The fire monitor shall be able to be fixed in any specified position.

6.4.1.3 Measure the pitching rotating angle and horizontal rotating angle of fire monitor with the goniometer and check if the fire monitor can be fixed in any specified angle.

6.4.1.4 Check whether the function of the limit device of each fire monitor is normal, and whether each fire monitor can stop automatically when it turns to the limit position.

6.4.2 Dynamic operation test of fire monitor

6.4.2.1 The test shall be conducted when the fire pump is started and the fire monitor is working at the rated injection pressure.

6.4.2.2 Check the operation performance of the fire monitor in accordance with [6.4.1.2](#).

6.4.2.3 Measure the rotation angle of the fire monitor in accordance with [6.4.1.3](#).

6.4.2.4 Measure the limit device of fire monitor in accordance with [6.4.1.4](#).

6.5 Test of control and alarm system

6.5.1 Check each alarm indication and buzzer on the fire control console. The display or alarm indicator shall be visual, and the buzzer shall be audible.