

# Rules for the Type Approval of Fixed Water-Based Fire-Extinguishing Systems in Machinery Spaces

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# GENERAL CONDITIONS

## Definitions:

"Administration" means the Government of the State whose flag the Ship is entitled to fly or under whose authority the Ship is authorized to operate in the specific case.

"IACS" means the International Association of Classification Societies.

"Interested Party" means the party, other than the Society, having an interest in or responsibility for the Ship, product, plant or system subject to classification or certification (such as the owner of the Ship and his representatives, the ship builder, the engine builder or the supplier of parts to be tested) who requests the Services or on whose behalf the Services are requested.

"Owner" means the registered owner, the ship owner, the manager or any other party with the responsibility, legally or contractually, to keep the ship seaworthy or in service, having particular regard to the provisions relating to the maintenance of class laid down in Part A, Chapter 2 of the Rules for the Classification of Ships or in the corresponding rules indicated in the specific Rules.

"Rules" in these General Conditions means the documents below issued by the Society:

- (i) Rules for the Classification of Ships or other special units;
- (ii) Complementary Rules containing the requirements for product, plant, system and other certification or containing the requirements for the assignment of additional class notations;
- (iii) Rules for the application of statutory rules, containing the rules to perform the duties delegated by Administrations;
- (iv) Guides to carry out particular activities connected with Services;
- (v) Any other technical document, as for example rule variations or interpretations.

"Services" means the activities described in Article 1 below, rendered by the Society upon request made by or on behalf of the Interested Party.

"Ship" means ships, boats, craft and other special units, as for example offshore structures, floating units and underwater craft.

"Society" or "TASNEEF" means Tasneef and/or all the companies in the Tasneef Group which provide the Services.

"Surveyor" means technical staff acting on behalf of the Society in performing the Services.

## Article 1

1.1. The purpose of the Society is, among others, the classification and certification of ships and the certification of their parts and components. In particular, the Society:

- (i) sets forth and develops Rules;
- (ii) publishes the Register of Ships;
- (iii) issues certificates, statements and reports based on its survey activities.

1.2. The Society also takes part in the implementation of national and international rules and standards as delegated by various Governments.

1.3. The Society carries out technical assistance activities on request and provides special services outside the scope of classification, which are regulated by these general conditions, unless expressly excluded in the particular contract.

## Article 2

2.1. The Rules developed by the Society reflect the level of its technical knowledge at the time they are published. Therefore, the Society, although committed also through its research and development services to continuous updating of the Rules, does not guarantee the Rules meet state-of-the-art science and technology at the time of publication or that they meet the Society's or others' subsequent technical developments.

2.2. The Interested Party is required to know the Rules on the basis of which the Services are provided. With particular reference to Classification Services, special attention is to be given to the Rules concerning class suspension, withdrawal and reinstatement. In case of doubt or inaccuracy, the Interested Party is to promptly contact the Society for clarification. The Rules for Classification of Ships are published on the Society's website: [www.tasneef.ae](http://www.tasneef.ae).

2.3. The Society exercises due care and skill:

- (i) in the selection of its Surveyors
- (ii) in the performance of its Services, taking into account the level of its technical knowledge at the time the Services are performed.

2.4. Surveys conducted by the Society include, but are not limited to, visual inspection and non-destructive testing. Unless otherwise required, surveys are conducted through sampling techniques and do not consist of comprehensive verification or monitoring of the Ship or of the items subject to certification. The surveys and checks made by the Society on board ship do not necessarily require the constant and continuous presence of the Surveyor. The Society may also commission laboratory testing, underwater inspection and other checks carried out by and under the responsibility of qualified service suppliers. Survey practices and procedures are selected by the Society based on its experience and knowledge and according to generally accepted technical standards in the sector.

## Article 3

3.1. The class assigned to a Ship, like the reports, statements, certificates or any other document or information issued by the Society, reflects the opinion of the Society concerning compliance, at the time the Service is provided, of the Ship or product subject to certification, with the applicable Rules (given the intended use and within the relevant time frame).

The Society is under no obligation to make statements or provide information about elements or facts which are not part of the specific scope of the Service requested by the Interested Party or on its behalf.

3.2. No report, statement, notation on a plan, review, Certificate of Classification, document or information issued or given as part of the Services provided by the Society shall have any legal effect or implication other than a representation that, on the basis of the checks made by the Society, the Ship, structure, materials, equipment, machinery or any other item covered by such document or information meet the Rules. Any such document is issued solely for the use of the Society, its committees and clients or other duly authorised bodies and for no other purpose. Therefore, the Society cannot be held liable for any act made or document issued by other parties on the basis of the statements or information given by the Society. The validity, application, meaning and interpretation of a Certificate of Classification, or any other document or information issued by the Society in connection with its Services, is governed by the Rules of the Society, which is the sole subject entitled to make such interpretation. Any disagreement on technical matters between the Interested Party and the Surveyor in the carrying out of his functions shall be raised in writing as soon as possible with the Society, which will settle any divergence of opinion or dispute.

3.3. The classification of a Ship, or the issuance of a certificate or other document connected with classification or certificate on and in general with the performance of Services by the Society shall have the validity conferred upon it by the Rules of the Society at the time of the assignment of class or issuance of the certificate; in no case shall it amount to a statement or warranty of seaworthiness,

structural integrity, quality or fitness for a particular purpose or service of any Ship, structure, material, equipment or machinery inspected or tested by the Society.

- 3.4. Any document issued by the Society in relation to its activities reflects the condition of the Ship or the subject of certification or other activity at the time of the check.
- 3.5. The Rules, surveys and activities performed by the Society, reports, certificates and other documents issued by the Society are in no way intended to replace the duties and responsibilities of other parties such as Governments, designers, ship builders, manufacturers, repairers, suppliers, contractors or sub-contractors, Owners, operators, charterers, underwriters, sellers or intended buyers of a Ship or other product or system surveyed.

These documents and activities do not relieve such parties from any fulfilment, warranty, responsibility, duty or obligation (also of a contractual nature) expressed or implied or in any case incumbent on them, nor do they confer on such parties any right, claim or cause of action against the Society. With particular regard to the duties of the ship Owner, the Services undertaken by the Society do not relieve the Owner of his duty to ensure proper maintenance of the Ship and ensure seaworthiness at all times. Likewise, the Rules, surveys performed, reports, certificates and other documents issued by the Society are intended neither to guarantee the buyers of the Ship, its components or any other surveyed or certified item, nor to relieve the seller of the duties arising out of the law or the contract, regarding the quality, commercial value or characteristics of the item which is the subject of transaction.

In no case, therefore, shall the Society assume the obligations incumbent upon the above-mentioned parties, even when it is consulted in connection with matters not covered by its Rules or other documents.

In consideration of the above, the Interested Party undertakes to relieve and hold harmless the Society from any third party claim, as well as from any liability in relation to the latter concerning the Services rendered.

Insofar as they are not expressly provided for in these General Conditions, the duties and responsibilities of the Owner and Interested Parties with respect to the services rendered by the Society are described in the Rules applicable to the specific Service rendered.

#### **Article 4**

- 4.1. Any request for the Society's Services shall be submitted in writing and signed by or on behalf of the Interested Party. Such a request will be considered irrevocable as soon as received by the Society and shall entail acceptance by the applicant of all relevant requirements of the Rules, including these General Conditions. Upon acceptance of the written request by the Society, a contract between the Society and the Interested Party is entered into, which is regulated by the present General Conditions.

- 4.2. In consideration of the Services rendered by the Society, the Interested Party and the person requesting the service shall be jointly liable for the payment of the relevant fees, even if the service is not concluded for any cause not pertaining to the Society. In the latter case, the Society shall not be held liable for non-fulfilment or partial fulfilment of the Services requested. In the event of late payment, interest at the legal current rate increased by 1.5% may be demanded.

- 4.3. The contract for the classification of a Ship or for other Services may be terminated and any certificates revoked at the request of one of the parties, subject to at least 30 days' notice to be given in writing. Failure to pay, even in part, the fees due for Services carried out by the Society will entitle the Society to immediately terminate the contract and suspend the Services.

For every termination of the contract, the fees for the activities performed until the time of the termination shall be owed to the Society as well as the expenses incurred in view of activities already programmed; this is without prejudice to the right to compensation due to the Society as a consequence of the termination.

With particular reference to Ship classification and certification, unless decided otherwise by the Society, termination of the contract implies that the assignment of class to a Ship is withheld or, if already assigned, that it is suspended or withdrawn; any statutory certificates issued by the Society will be withdrawn in those cases where provided for by agreements between the Society and the flag State.

#### **Article 5**

- 5.1. In providing the Services, as well as other correlated information or advice, the Society, its Surveyors, servants or agents operate with due diligence for the proper execution of the activity. However, considering the nature of the activities performed (see art. 2.4), it is not possible to guarantee absolute accuracy, correctness and completeness of any information or advice supplied. Express and implied warranties are specifically disclaimed.

Therefore, except as provided for in paragraph 5.2 below, and also in the case of activities carried out by delegation of Governments, neither the Society nor any of its Surveyors will be liable for any loss, damage or expense of whatever nature sustained by any person, in tort or in contract, derived from carrying out the Services.

- 5.2. Notwithstanding the provisions in paragraph 5.1 above, should any user of the Society's Services prove that he has suffered a loss or damage due to any negligent act or omission of the Society, its Surveyors, servants or agents, then the Society will pay compensation to such person for his proved loss, up to, but not exceeding, five times the amount of the fees charged for the specific services, information or opinions from which the loss or damage derives or, if no fee has been charged, a maximum of AED5,000 (Arab Emirates Dirhams Five Thousand only). Where the fees charged are related to a number of Services, the amount of the fees will be apportioned for the purpose of the calculation of the maximum compensation, by reference to the estimated time involved in the performance of the Service from which the damage or loss derives. Any liability for indirect or consequential loss, damage or expense is specifically excluded. In any case, irrespective of the amount of the fees charged, the maximum damages payable by the Society will not be more than AED5,000,000 (Arab Emirates Dirhams Five Millions only). Payment of compensation under this paragraph will not entail any admission of responsibility and/or liability by the Society and will be made without prejudice to the disclaimer clause contained in paragraph 5.1 above.

- 5.3. Any claim for loss or damage of whatever nature by virtue of the provisions set forth herein shall be made to the Society in writing, within the shorter of the following periods: (i) THREE (3) MONTHS from the date on which the Services were performed, or (ii) THREE (3) MONTHS from the date on which the damage was discovered. Failure to comply with the above deadline will constitute an absolute bar to the pursuit of such a claim against the Society.

#### **Article 6**

- 6.1. These General Conditions shall be governed by and construed in accordance with United Arab Emirates (UAE) law, and any dispute arising from or in connection with the Rules or with the Services of the Society, including any issues concerning responsibility, liability or limitations of liability of the Society, shall be determined in accordance with UAE law. The courts of the Dubai International Financial Centre (DIFC) shall have exclusive jurisdiction in relation to any claim or dispute which may arise out of or in connection with the Rules or with the Services of the Society.

- 6.2. However,

- (i) In cases where neither the claim nor any counterclaim exceeds the sum of AED300,000 (Arab Emirates Dirhams Three Hundred Thousand) the dispute shall be referred to the jurisdiction of the DIFC Small Claims Tribunal; and
- (ii) for disputes concerning non-payment of the fees and/or expenses due to the Society for services, the Society shall have the

right to submit any claim to the jurisdiction of the Courts of the place where the registered or operating office of the Interested Party or of the applicant who requested the Service is located.

In the case of actions taken against the Society by a third party before a public Court, the Society shall also have the right to summon the Interested Party or the subject who requested the Service before that Court, in order to be relieved and held harmless according to art. 3.5 above.

#### **Article 7**

- 7.1.** All plans, specifications, documents and information provided by, issued by, or made known to the Society, in connection with the performance of its Services, will be treated as confidential and will not be made available to any other party other than the Owner without authorization of the Interested Party, except as provided for or required by any applicable international, European or domestic legislation, Charter or other IACS resolutions, or order from a competent authority. Information about the status and validity of class and statutory certificates, including transfers, changes, suspensions, withdrawals of class, recommendations/conditions of class, operating conditions or restrictions issued against classed ships and other related information, as may be required, may be published on the website or released by other means, without the prior consent of the Interested Party. Information about the status and validity of other certificates and statements may also be published on the website or released by other means, without the prior consent of the Interested Party.
- 7.2.** Notwithstanding the general duty of confidentiality owed by the Society to its clients in clause 7.1 above, the Society's clients hereby accept that the Society may participate in the IACS Early Warning System which requires each Classification Society to provide other involved Classification Societies with relevant technical information on serious hull structural and engineering systems failures, as defined in the IACS Early Warning System (but not including any drawings relating to the ship which may be the specific property of another party), to enable such useful information to be shared and used to facilitate the proper working of the IACS Early Warning System. The Society will provide its clients with written details of such information sent to the involved Classification Societies.
- 7.3.** In the event of transfer of class, addition of a second class or withdrawal from a double/dual class, the Interested Party undertakes to provide or to permit the Society to provide the other Classification Society with all building plans and drawings, certificates, documents and information relevant to the classed unit, including its history file, as the other Classification Society may require for the purpose of classification in compliance with the applicable legislation and relative IACS Procedure. It is the Owner's duty to ensure that, whenever required, the consent of the builder is obtained with regard to the provision of plans and drawings to the new Society, either by way of appropriate stipulation in the building contract or by other agreement.
- In the event that the ownership of the ship, product or system subject to certification is transferred to a new subject, the latter shall have the right to access all pertinent drawings, specifications, documents or information issued by the Society or which has come to the knowledge of the Society while carrying out its Services, even if related to a period prior to transfer of ownership.

#### **Article 8**

- 8.1.** Should any part of these General Conditions be declared invalid, this will not affect the validity of the remaining provisions.



# RULES FOR THE TYPE APPROVAL OF FIXED WATER-BASED FIRE-EXTINGUISHING SYSTEMS IN MACHINERY SPACES

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# CHAPTER 1

# GENERAL REQUIREMENTS FOR APPROVAL

## 1 General

### 1.1 Premise

**1.1.1** Fixed water-based fire-extinguishing systems for use in machinery spaces, equivalent to fixed fire-extinguishing systems required by Tasneef Rules, may be accepted on board if Tasneef type approved.

Systems dealt with in these Rules are also to comply with the applicable requirements given in the specific Tasneef Rules.

The arrangement of the systems on board is subject to the approval of the drawings relevant to the single installation.

### 1.2 Field of application

#### 1.2.1 General

These Rules apply to fixed aerosol fire-extinguishing systems for use in machinery spaces of ships and yachts (hereafter referred to simply as ships).

- Chapter 1 applies to all ships.
- Chapter 2 applies to ships having a length L not exceeding 24 m and machinery spaces having a gross volume not exceeding 70 m<sup>3</sup>.
- Chapter 3 applies to ships having a length L exceeding 24m or machinery spaces having a gross volume exceeding 70 m<sup>3</sup>.

L is the length in metres of the full load waterline measured from the forward side of the stem to the aft side of the sternpost, or transom, on the hull plain of symmetry.

#### 1.2.2 Alternative

As an alternative, at the request of the Interested Parties, Tasneef applies European Union Directive 96/98/EC, as amended and adopted by the Council on 26 December 1996, to those ships subject to this Directive.

### 1.3 Documentation

**1.3.1** The request for type approval is to be submitted to Tasneef by the Manufacturer, or by the Applicant if authorised by the Manufacturer, and is to include:

- a) the name of the Manufacturer;
- b) the designation of the system;
- c) a schematic layout of the system;
- d) complete specification of the materials used for all system components;
- e) the installation and maintenance manual;
- f) documentation relevant to previous tests and approvals, if any.

### 1.4 Issue and validity of the Type Approval Certificate

**1.4.1** Subject to the satisfactory outcome of the required checks and tests, Tasneef issues to the manufacturing firm a "Type Approval Certificate" valid for all fixed water-based fire-extinguishing systems of the same type, dimensions, layout, material, etc as that subjected to type testing. The validity of the certificate is based on the assumption of the constant conformity of the single products manufactured with the satisfactorily tested prototype. The firm is entirely responsible for such conformity. The Type Approval Certificate may be suspended or cancelled by Tasneef when the conditions on which the type approval was based are no longer fulfilled. The Type Approval Certificate is valid for five years from the date of issue.

### 1.5 Renewal of the Type Approval Certificate

**1.5.1** In order to renew the Type Approval Certificate, the documentation in [1.3] is to be submitted to Tasneef with indication of any modifications in respect of the previous approval.

On the basis of the review of such documentation, Tasneef will establish the checks and tests to be carried out in order to renew the Type Approval Certificate.

### 1.6 Repetition of the tests

**1.6.1** Tasneef reserves the right to repeat type tests, wholly or in part, in the case of modification of the Rules on the basis of which the type approval was issued or in the event of doubts or complaints.

## 2 Definitions

### 2.1 Antifreeze system

**2.1.1** Antifreeze system is a wet pipe system containing an antifreeze solution and connected to a water supply. The antifreeze solution is discharged, followed by water, immediately upon operation of nozzles.

### 2.2 Bilge area

**2.2.1** Bilge area is the space between the solid engine room floor plates and the bottom of the engine room.

### 2.3 Deluge system

**2.3.1** Deluge system is a system employing open nozzles attached to a piping system connected to a water supply through a valve that is opened by the operation of a detection system installed in the same areas as the nozzles or opened manually. When this valve opens, water flows into

## Chapter 1

the piping system and discharges from all nozzles attached thereto.

### 2.4 Dry pipe system

**2.4.1** For the purpose of these Rules, the terms "agent" and "medium" are interchangeable.

### 2.5 Fire extinction

**2.5.1** Fire extinction is a reduction of the heat release from the fire and a total elimination of all flames and glowing parts by means of direct and sufficient application of extinguishing media.

### 2.6 Preaction system

**2.6.1** Preaction system is a system employing automatic nozzles attached to a piping system containing air that may or may not be under pressure, with a supplemental detection system installed in the same area as the nozzles. Actuation of the detection system opens a valve that permits water to flow into the piping system and to be discharged from any nozzles that may be open.

### 2.7 Water-based extinguishing medium

**2.7.1** Water-based extinguishing medium is fresh water or seawater with or without additives mixed to enhance fire-extinguishing capability.

### 2.8 Wet pipe system

**2.8.1** Wet pipe system is a system employing nozzles attached to a piping system containing water and connected to a water supply so that water discharges immediately from the nozzles upon system activation.

## 3 Principal requirements

### 3.1 General

**3.1.1** The system is to be capable of manual release.

The system is to be designed and installed in accordance with international standards acceptable to Tasneef and manufactured and tested to the satisfaction of Tasneef in accordance with the following Chapters, as applicable.

The system is to be capable of continuously supplying water for at least 30 min in order to prevent re-ignition or fire spread within that period of time. Systems which operate at a reduced discharge rate after the initial extinguishing period are to have a second full fire-extinguishing capability available within a 5-minute period of initial activation.

For systems intended to be installed on ships to which Chapter 2 applies, the water-based fire extinguishing medium discharge can be also achieved by means of pressurised cylinders, provided that the system is designed in

such a way that the quantity of extinguishing medium and propelling agent is capable of providing two independent discharges.

### 3.2 System and components

**3.2.1** The system and its components are to be suitably designed to withstand ambient temperature changes, vibration, humidity, shock, impact, clogging and corrosion normally encountered in machinery spaces. Components within the protected spaces are to be designed to withstand the elevated temperatures that could occur during a fire.

The nozzle location, type of nozzle and nozzle characteristics are to be within the limits tested to provide effective fire extinction.

The electrical components of the pressure source for the system are to have a minimum rating of IP 54. The system is to be supplied by both main and emergency sources of power and provided with an automatic change-over switch. The emergency power supply is to be provided from outside the protected machinery space.

The system is to be provided with a redundant means of pumping. The capacity of the redundant means is to be sufficient to compensate for the loss of any single supply pump.

Systems may be grouped into separate sections within a protected space. The sectioning of the system within such spaces is to be approved by Tasneef in each case.

In all cases the capacity and design of the system are to be based on the complete protection of the space demanding the greatest volume of water.

The system operation controls are to be available at easily accessible positions outside the spaces to be protected and are not to be liable to be cut off by a fire in the protected spaces.

Pressure source components of the system are to be located outside the protected spaces.

A means is to be provided for testing the operation of the system for ensuring the required pressure and flow.

Activation of any water distribution valve is to give a visual and audible alarm in the protected space and at the wheelhouse. The alarm in the wheelhouse is to indicate the specific valve activated.

Operating instructions for the system are to be displayed at each operating position.

Spare parts and operating and maintenance instructions for the system are to be provided, as recommended by the Manufacturer.

Additives are not to be used for the protection of normally occupied spaces unless they have been approved for fire protection service by an independent authority. The approval is to consider possible adverse health effects to exposed personnel, including inhalation toxicity.

## CHAPTER 2

TEST METHOD FOR SYSTEMS OF SHIPS HAVING  
A LENGTH  $\leq 24$  M AND WITH MACHINERY  
SPACES  $\leq 70$  M<sup>3</sup>

## 1 Fire test method for fixed water-based fire-extinguishing systems of ships having a length L not exceeding 24 m and machinery spaces having a gross volume not exceeding 70 m<sup>3</sup>

### 1.1 Scope

**1.1.1** This test method is intended to evaluate the extinguishing effectiveness of fixed water-based fire-extinguishing systems for the protection of machinery spaces.

The test method covers the minimum requirements for fire-extinguishing and prevention against re-ignition for fires in machinery spaces.

### 1.2 Sampling

**1.2.1** The components to be tested are to be supplied by the Manufacturer together with design and installation criteria, operational instructions, drawings and technical data sufficient for identification of the components.

### 1.3 Test method

#### 1.3.1 Test enclosure

The test is to be performed in a test room with a gross volume equal to that for which the fire-extinguishing system approval is foreseen.

Fig 1 shows an example of a test enclosure of length 6,1 m, width 2,4 m and height 2,4 m; specific layouts will be examined according to the volumes tested.

#### 1.3.2 Engine/ Bilge Mock-Up

The engine mock-up is to be constructed with steel plating having a thickness of at least 2 mm; a bilge system is to be created by steel plating located close to the sides of the engine mock-up with a fuel tray placed underneath the engine to simulate fuel accumulation (hidden pool fire). A fuel tray is to be situated at the forward end of the engine mock-up (open pool fire).

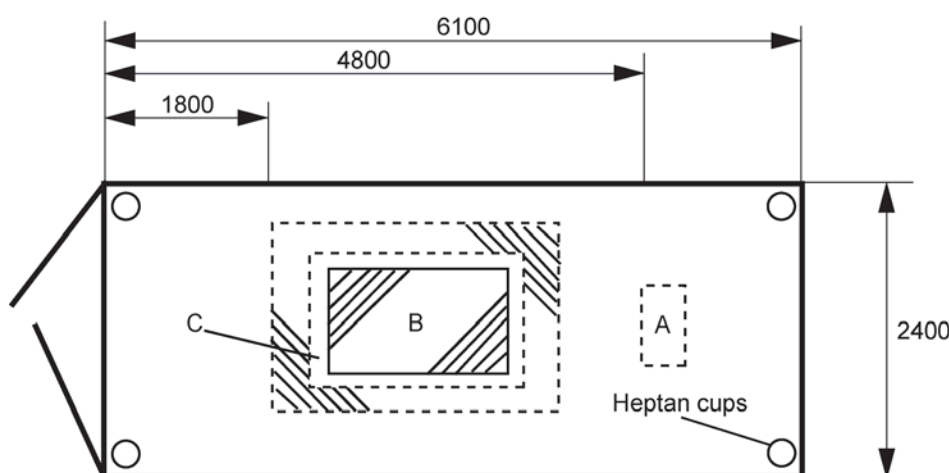
The spray C is to be placed below the overhanging steel plate on the top of the mock-up (see Fig 2).

The wood crib test is to be carried out as a separate fire test. The position of the wood crib inside the test enclosure is to be the same as tray "A" in Fig 1 during pool fire tests.

#### 1.3.3 Integrity of test enclosure

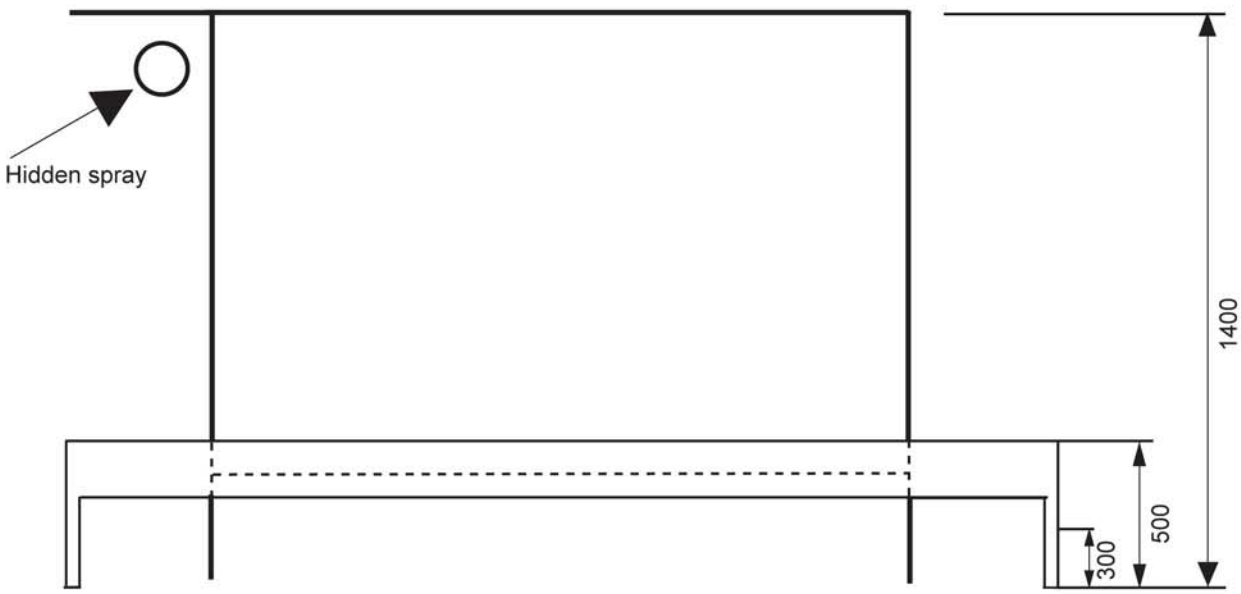
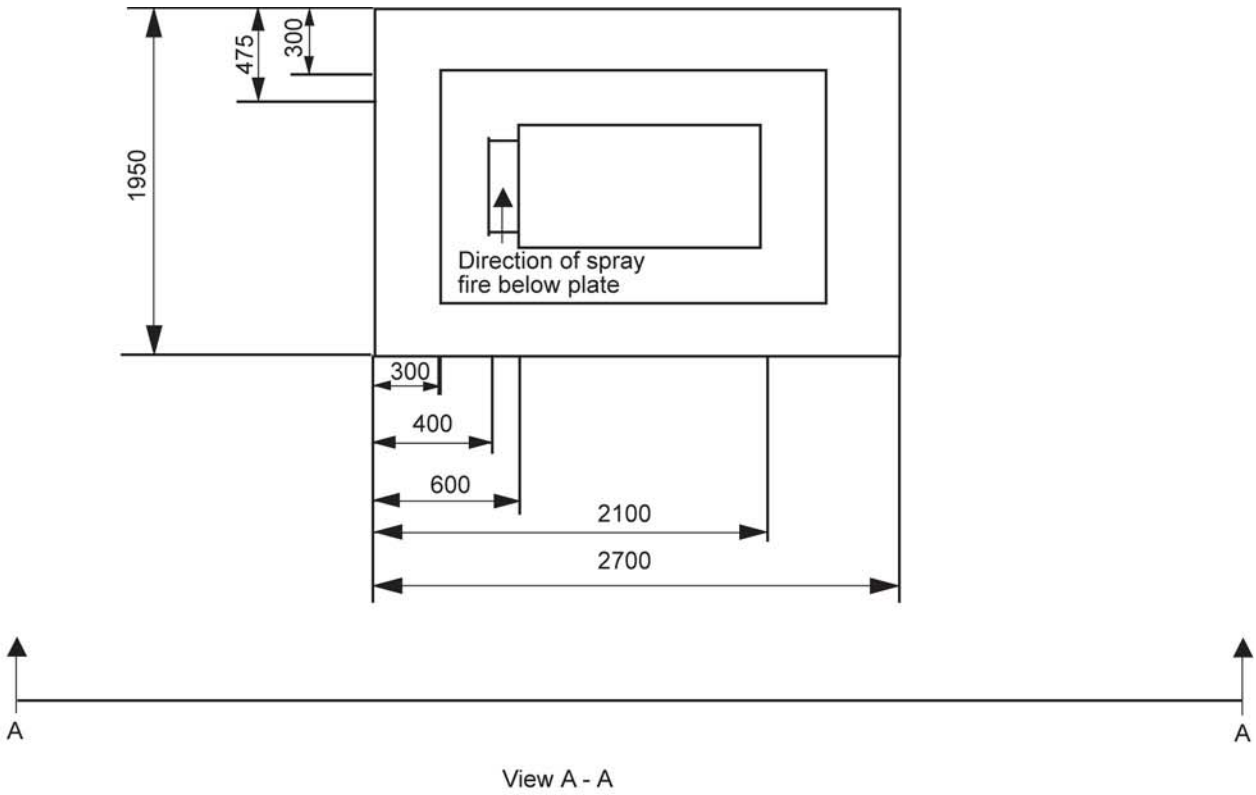
The test enclosure is to be nominally leaktight when doors and hatches are closed.

Figure 1 : Test enclosure



Note: out of scale

Figure 2 : Engine mock-up



Note: out of scale

### 1.3.4 Instrumentation and measurements

Instrumentation for the continuous measurement and recording of test conditions is to be employed. The following measurements are to be made:

- temperature at two vertical positions (e.g. 1 m, 2 m);
- enclosure pressure;
- oxygen (per cent) at mid-room height;
- fuel nozzle pressure in the case of spray fires;
- fuel flow rate in the case of spray fires;
- discharge nozzle pressure;
- discharge nozzle water flow rate;
- discharge duration.

### 1.3.5 Fire scenarios

The following tests are to be performed; fires are defined in Tab 1:

- open pool fire (diesel fuel and cans containing heptan)
- hidden spray fire (diesel fuel)
- combined hidden pool (engine lubricating oil) / hidden spray (diesel fuel)
- combined open pool (diesel fuel) / hidden pool (engine lubricating oil) / hidden spray (diesel fuel) / cans containing heptan
- wood crib.

## 1.4 Extinguishing system

### 1.4.1 System installation

The extinguishing system is to be installed according to the Manufacturer's design and installation specifications, which are to include:

- maximum horizontal and vertical nozzle spacing;
- distance of nozzles below ceiling.

### 1.4.2 System operating pressure

The system fire tests are to be conducted at the minimum system operating pressure, or under conditions providing the minimum water application rate.

## 1.5 Procedure

### 1.5.1 Fuel levels in trays

The trays used in the test are to be filled with at least 30 mm fuel on a water base. Freeboard is to be  $150 \pm 10$  mm.

### 1.5.2 Fuel flow and pressure measurements

For spray fires, the fuel flow and pressure are to be measured before and during each test.

### 1.5.3 Wood crib

The wood crib is to consist of twelve, trade size 30 mm x 30 mm by 200 mm long, kiln dried spruce or fir lumber members. The members are to be placed in 4 alternate layers of three at right angles to one another. Members are to be evenly spaced forming a square structure (spacing approx. 40 mm).

### 1.5.4 Ventilation

- Pre-burn period

During the pre-burn period the test enclosure is to be well ventilated. The oxygen concentration, as measured at mid-room height, is to be not less than 20 per cent volume at the time of system discharge.

- End of pre-burn period.

Doors, ceiling hatches and other ventilation openings are to be closed at the end of the pre-burn period. However, when some openings fitted on the test enclosure are not kept closed during the fire tests, this is to be duly recorded in the test report.

### 1.5.5 Duration of test

Doors, ceiling hatches and other ventilation openings are to be closed at the end of the pre-burn period.

- Pre-burn time

Fires are to be ignited such that the following burning times occur before the start of agent discharge:

- sprays - 5 to 15 s
- trays - 1 min
- wood crib 3 min

- Discharge time

The fire is to be allowed to burn until the fire is extinguished or for a period of 15 minutes, whichever is the lesser, measured from the ignition. If used, the fuel spray is to be shut off 15 s after the end of water discharge.

Table 1

Ref.	Constituents	Quantity	Container type	Container size
Tray A	Diesel fuel oil	10 l	Steel tray	1,20 m x 0,80 m = 0,96 m <sup>2</sup>
Tray B	Engine lube oil	3,5 l	Steel tray	1,00 m x 0,50 m = 0,50 m <sup>2</sup>
Spray C	Hidden spray fire - Diesel fuel oil	1,1 l/min	Pressurised container at 3 bar pressure	
Cans 1-4	Heptane	0,3 l/can	Open tin approx. 10 cm diameter	0,75 l

## Chapter 2

### 1.5.6 Measurements and observations

- a) Before testing
  - 1) temperature of test enclosure, fuel and engine mock-up;
  - 2) initial weights of water-based extinguishing medium containers, if any;
  - 3) verification of integrity system and nozzles;
- b) During the test
  - 1) start of the ignition procedure;
  - 2) start of the test (ignition);
  - 3) time when the extinguishing system is activated;
  - 4) time when all fires are extinguished;
  - 5) time when the extinguishing system is shut off;
  - 6) time of re-ignition, if any;
  - 7) time when the fuel flow for the spray fire is shut off;
  - 8) time when the test is finished; and
  - 9) data from all test instrumentation.

### 1.5.7 Tolerances

Unless otherwise stated, the following tolerances are to apply:

- a) length  $\pm 2\%$  of value;
- b) volume  $\pm 5\%$  of value;
- c) pressure  $\pm 3\%$  of value;
- d) temperature  $\pm 5\%$  of value; and
- e) concentration  $\pm 5\%$  of value.

### 1.6 Acceptance criteria

**1.6.1** All fires in the fire-extinguishing tests are to be extinguished within 15 minutes of system activation or after the end of water discharge (whichever is the lesser) and there is to be no re-ignition or fire spread.

### 1.7 Test report

**1.7.1** The test report is to include the following information:

- a) name and address of the test laboratory;
- b) date and identification number of the test report;
- c) name and address of the client;
- d) purpose of the test;
- e) method of sampling;
- f) name and address of the Manufacturer or Supplier of the product;
- g) name or other identification marks of the product;
- h) description of the tested product:
  - drawings;
  - descriptions;
  - assembly instructions;
  - specification of included materials;
  - detailed drawing of test set-up;
- i) date of supply of the product;
- j) date of test;
- k) test method;
- l) drawing of each test configuration;
- m) measured nozzle characteristics;
- n) identification of the test equipment and instruments used;
- o) conclusions;
- p) deviations from the test method, if any;
- q) test results, including measurements and observations during and after the test; and
- r) date and signature.



## CHAPTER 3

# TEST METHOD FOR SYSTEMS OF SHIPS HAVING A LENGTH > 24 M OR MACHINERY SPACES > 70 M<sup>3</sup>

### 1 Fire test method for fixed water-based fire-extinguishing systems of ships having a length L exceeding 24 m or machinery spaces having a gross volume exceeding 70 m<sup>3</sup>

#### 1.1 Scope

**1.1.1** This test method is intended to evaluate the extinguishing effectiveness of fixed water-based fire-extinguish-

ing systems for the protection of machinery spaces of ships having a length exceeding 24 m or machinery spaces with a volume exceeding 70 m<sup>3</sup>.

#### 1.2 Test method

**1.2.1** The test is to be carried out in accordance with IMO MSC/Circ.1165.