

Only the Danish version is authentic

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Technical regulation on the
construction and equipment, etc. of
passenger ships on domestic voyages

CHAPTER II - 2 N (2)

Construction, fire protection, fire detection and fire extinction Additions to the provisions of the "Fire Safety Systems Code" (FSS-Code), chapter 5

Installation and testing of fire extinction systems with mixed atmospheric gases in engine spaces on board ships

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Installation and testing of fire extinction systems with mixed atmospheric gases in engine spaces on board ships

1 General

The provisions of chapter 5 of the FSS Code shall apply by analogy.

2 Tests

- .1 Each individual mixture of gases shall be tested in accordance with the standard tests stipulated in MSC/Circ.848.*
- .2 A recognised test company shall test the mixture of gases with a satisfactory result in accordance with the standard tests referred to in .1 above. The approval certificate from such a test company shall, among others, state the composition of the mixture and the minimum and maximum oxygen concentrations permitted in the protected space when the extinguishant has been released (the concentration of extinguishant).*

3 Installation

- .1 Under normal circumstances, the system may be designed only for manual release.*
- .2 In special cases, the Danish Maritime Authority may, however, permit automatic release of both new and existing fire extinction systems provided that:
 - .1 the ship in question is not covered by the provisions of the SOLAS Convention;*
 - .2 a green indicator lamp and a sign on the release panel indicate when the system has been set for manual release;*
 - .3 a red indicator lamp and a sign on the release panel indicate when the system has been set for automatic release;*
 - .4 a conspicuous red sign with white letters (about 30 pitch) is affixed below the red indicator lamp with the following text:
"When at sea, the system may not be set for automatic release."**
- .3 If the system is intended to serve more than one space, its storage and release functions shall be arranged so as to ensure that the required volumes of extinguishant are released into the spaces.*

- .4 *Means shall be provided for automatic stop of all ventilators serving the protected space before the extinguishant is released.*
- .5 *At the release point or points, written instructions shall be available clearly stating that all ventilation and all combustion engines must be stopped and that all fire dampers and hatches shall be closed before the system is released.*
- .6 *The release arrangement shall be designed so that 85% of the amount of extinguishant required according to the approval certificate is released within a maximum period of 120 seconds.*
- .7 *It shall be possible to maintain the minimum concentration of extinguishant in the space for at least 15 minutes.*
- .8 *The system shall be designed to resist temperatures, vibrations, shocks and mechanical impact, fouling and corrosion as well as moist that may occur in the space where the system is installed.*
- .9 *The release of the system as well as any release via the frangible discs of the containers may not present any danger to personnel engaged in the maintenance of equipment or using the normal access ladders to and exits from the space.*
- .10 *It shall be possible for the crew to check the pressure (the content) of the containers without any risk.*
- .11 *Unless otherwise provided, the amount of the mixture of gases available for cargo spaces shall be sufficient to produce the minimum volume of free mixture stated on the approval certificate. If two or more cargo spaces are connected through ventilation ducts, such spaces shall be considered one space.*
- .12 *The amount of the mixture of gases available for engine spaces shall be sufficient to produce the minimum volume of free mixture stated on the approval certificate. Two or more engine spaces of category A that are not separate shall be considered one space.*
- .13 *The number and location of nozzles shall be such as to achieve a homogenous distribution of the mixture of gases in the space.*
- .14 *All doors leading to spaces protected by a system with atmospheric gases shall be clearly marked with a sign stating that the space is protected by a system with atmospheric gases and that the space shall be left when the alarm sounds.*

4 Testing on board

- .1 *The distribution and extinguishing capacity of each system installed shall be demonstrated in practice on board.*
- .2 *The extinguishant shall be tested in connection with a test fire that is under control in the form of fires caused by burning alcohol fuels in small trays placed at different levels in the engine room; during the test, the combustion engines and the ventilation shall have been stopped and the fire dampers shall have been closed.*

The fires shall be distributed evenly throughout the space.
- .3 *When the extinguishant has been released, the concentration of oxygen in the engine space is measured in order to prove*

that the extinguishant has been well distributed. The concentration of oxygen may, at no point in time, be below 10% and not above 12%.

In addition, the following shall be checked:

- .1 How long time it takes to discharge the extinguishant into the space.*
- .2 How long time it takes from the release of the system has taken place until all fires in the trays have been extinguished.*
- .3 For how long time the concentration capable of extinguishing a fire is maintained (in accordance with the approval).*
- .4 If, during the above tests, doubt arises as to the efficiency of the extinguishant, the Danish Maritime Authority may require further tests to be carried out.*

The Danish Maritime Authority may, however, sustain from requiring such a test if previous tests carried out in spaces of the same design and size and with approximately the same number and location of nozzles have proved satisfactory.

- .5 The release arrangement shall be designed so that the release function can be demonstrated. Such a check shall be demonstrated for the Danish Maritime Authority with a satisfactory result before the system is put into operation.*

5 Installation of pressure containers and surveillance system

- .1 The mixture of gases may be stored in the protected space, cf. however paragraph 3.8. The containers may be distributed individually or in sections throughout the entire space, but shall always be divided into at least two sections.*
- .2 A manual, servo-driven or electrically driven release arrangement shall be provided outside the protected space. Two sources of power shall be connected to this release arrangement, both of which shall be located outside the protected space and shall be readily available. In the case of engine rooms, one of the said sources of power may, however, be located in the protected space.*
- .3 Electrical circuits shall be under surveillance for defects and power failure by means of visual and acoustic alarms.*
- .4 Pneumatic, hydraulic or electrical release circuits connecting the containers shall be available in duplicate. Pneumatic or hydraulic sources of pressure shall be under surveillance for pressure failure by means of visual and acoustic alarms.*
- .5 In the protected space, the electrical circuits needed to release the system shall be carried in fire-proof cables in accordance with the standards of the IEC. The required piping for hydraulic or pneumatic operation shall be made of steel or another similar heat-resistant material, which the Danish Maritime Authority can approve.*
- .6 All doors leading to the protected space shall be marked with the following text: "The space is connected to a fire-extinguishing system using fire-extinguishing gases and must be left immediately if the alarm sounds."*

.7 *Arrangements in connection with systems serving spaces that require only one or two containers of ordinary size shall be executed to the satisfaction of the Danish Maritime Authority.*

6 *Pressure containers*

.1 *The containers shall comply with the Danish or any other EU and EEA state provisions on containers of the type in question in force at any time. Containers manufactured in other countries may be permitted provided that they comply with a recognised standard in the country in question and that the safety level of this standard is similar to that of the EU or EEA states or provided that they comply with the regulations on such containers used by a recognised classification society. A maximum pressure of 30 N/mm² shall be permitted.*

.2 *Any container or container valve shall be fitted with a frangible disc which, according to the manufacturer's guarantees, protects the container against harmful overpressure, and the arrangement shall allow gas to flow freely from the container if the frangible disc bursts.*

.3 *The tare and gross weight, month and year of the latest pressure test as well as the test pressure shall be stamped on the containers.*

.4 *Only the manufacturer or other companies approved by the manufacturer may charge the containers.*

The companies are responsible for the charging of the containers and the composition of the mixture of gases

The companies shall issue a certificate stating the composition of the mixture and this certificate shall be delivered together with the container.

Furthermore, in a conspicuous place, a durable label shall be affixed to the containers stating:

.1 *the composition of the mixed/atmospheric mixture of gases;*

.2 *date and year of the charging;*

.3 *the name and address of the company responsible for the charging.*

.5 *The containers shall be fixed and placed so that it is easy to check the container valves. Furthermore, they shall be stored above the floor and be protected against corrosion. The marking of the containers, including their label and the size of the connection for the outlet nozzle on both the container valve and container manifold shall be executed in accordance with the standards in force.*

.6 *The containers shall be pressure tested every 20 years by a recognised test institute, a recognised classification society or by the chief engineer of the ship in question (only on board ships where a certificate of competency as a chief engineer officer is required in accordance with the STCW Convention, chapter III, regulation III-2).*

.7 *If more than 5 years have passed since the latest pressure test, a discharged container may not be recharged until a renewed pressure test has been carried out with satisfactory result.*

- .8 *If, in connection with the inspection of the containers, a 10% loss of pressure or more is found, the container in question shall be recharged.*

7 *Alarm and release arrangement*

- .1 *Alarms for the surveillance of the system shall be located at a central point so that they are easily accessible to the responsible crewmembers at all times when the ship is at sea or in port.*
- .2 *The electrical circuits and/or pipes necessary to release a system as well as the location of the containers shall be such that it will be possible to release the entire fire-extinguishing volume prescribed in paragraph 3.11 or 3.12 to the protected space in case one of the release pipes is damaged by a fire or explosion in the space in question.*
- .3 *The containers shall be under surveillance for a drop in pressure caused by leakage and release. Visual and acoustic alarms shall be fitted that sound when 80% of the recharging pressure has been reached at 20 C.*

8 *Local, automatic systems*

- .1 *Local, automatic, permanently installed fire-extinguishing systems located in encased areas (in engine spaces) presenting a great fire hazard may be permitted provided that they are independent of the prescribed, permanently installed fire-extinguishing system.*
- .2 *The area where such an additional, local protection is provided shall primarily be on a working deck and at the same level as the access to the space. More than one working deck may be permitted at the discretion of the Danish Maritime Authority if means of access are provided at each level.*
- .3 *The size of the space and the means of access thereto as well as the location of the machinery shall be arranged so that it is possible to leave all points in the space in less than 10 seconds.*
- .4 *The activation of a system shall be indicated both visually and acoustically outside any means of access to the engine space and on the navigation bridge or in the space where the fire control equipment is located.*
- .5 *A sign stating that the space contains one or more automatic fire-extinguishing systems and giving the extinguishant used shall be affixed outside any means of access thereto.*
- .6 *Outlet nozzles and frangible discs shall be located so that the release does not present any danger to personnel using ordinary access ladders to and exits from the space. Furthermore, it shall be ensured that personnel engaged in the maintenance of machinery are protected against inadvertent release of extinguishants.*
- .7 *The system shall be designed to resist temperatures, vibrations, shocks and mechanical impact, fouling and corrosion as well as moist that may occur in the space where the system is installed.*
- .8 *Measures shall be taken to allow the crew to check the pressure (the content) of the containers without any risk.*

- .9 *The total amount of extinguishant in the local, automatic installations shall be such that the maximum permitted concentration of the mixture of gases, based on the net cubic capacity of the encased space, is not exceeded. This requirement shall be applied when either a local, automatic system or a permanently installed system has been released, but not if both systems have been released.*
- .10 *Local, automatic fire-extinguishing systems shall be designed so that their release does not lead to loss of electrical power or deterioration of the ship's manoeuvrability.*

9 *Inspection and checks*

- .1 *Manufacturers of systems shall also provide customers with a description of the system, including a checklist for maintenance.*
- .2 *The ship's chief engineer or a classification society or company recognised by the Danish Maritime Authority shall check the system at least once a year.*
- .3 *The continuous inspections, etc. carried out by the chief engineer or by order of the ship's management shall be recorded in the ship's survey book stating the extent of the survey, any repairs made as well as the date of the inspection.*