International Standard

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Ships and marine technology — Fire-extinguishing systems for protection of galley cooking equipment

Navires et technologie maritime — Systèmes d'extinction d'incendie des équipements de cuisine

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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*.

This fourth edition cancels and replaces the third edition (ISO 15371:2015), which has been technically revised.

The main changes are as follows:

— Clause 2 and Bibliography have been added;

— Clause 3, 4.4 and 5.4 have been modified.

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

This document provides the marine industry with a means for evaluating the effectiveness of fire-extinguishing systems for a variety of grease-laden cooking equipment that can be found in a galley. This document is also referenced in the International Maritime Organization (IMO) International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended[1]. This document aims to provide organizations who are party to SOLAS with a means of ensuring that deep-fat cooking equipment conforms to the fire suppression requirements prescribed in SOLAS.

Ships and marine technology — Fire-extinguishing systems for protection of galley cooking equipment

1 Scope

This document applies to the design, testing, and operation of pre-engineered fire extinguishing systems that protect galley hoods, ducts, fryers and other grease-laden cooking equipment.

This document provides requirements for the construction and performance of components within pre-engineered fire-extinguishing system units. This document also provides minimum requirements for the testing and evaluation of components.

A product that contains features, characteristics, components, materials or systems that are new or different from those covered by the requirements in this document and that involve a risk of fire, electric shock, or injury to persons, can be evaluated using the appropriate additional component and end product testing.

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
auxiliary equipment
equipment used in conjunction with the extinguishing system

Note 1 to entry: Auxiliary equipment can be used to shut down power, fuel supply or ventilation to the hazard area being protected or to initiate alarm or signalling devices.

3.2
cooking equipment
cooking device that has, or is capable of having, a surface of liquid grease or one involving cooking with grease

Note 1 to entry: Deep fat fryer, griddle, range, chain-broiler, electric char-broiler, charcoal broiler, mesquite broiler, gas radiant char broiler, wok, tilt skillet/braising pan and similar equipment.

Note 2 to entry: The protected area is limited to the cooking area of the equipment only.

3.3
cooking grease
vegetable shortening incorporating an antifoaming agent

3.4
cylinder valve assembly
container that incorporates a valve and that provides storage for the extinguishing agent and expellant gas until the valve is actuated

Note 1 to entry: For expellant-gas carriage operated units, this assembly includes the extinguishing agent storage container and cartridge mechanism.

3.5
deep fat fryer
commercially available cooking equipment in which cooking grease in depth are used

3.6
discharge nozzle
device that is used to distribute the extinguishing agent over or into a specific area

3.7
discharge rate
ratio of the quantity of the extinguishing agent discharged from a nozzle to the discharge time (time interval between the first appearance of the extinguishing agent at the nozzle and the time at which the discharge becomes predominantly gaseous or ceases to be measured to within ±1 s)

Note 1 to entry: This rate is expressed in kg/s.

3.8
duct
duct system
continuous enclosed passage for the transmission of air and cooking vapours

3.9
expellant gas
dry nitrogen or other dry gas to facilitate the discharge of extinguishing agent from the cylinder valve assembly

3.10
extinguishing system unit
identified components that can be assembled into a system for the discharge of an extinguishing agent through fixed piping and nozzles for the purpose of extinguishing fires

3.11
gas cartridge
container that provides storage for an expellant gas only

3.12
hood
device provided as part of an exhaust system to direct and capture grease vapours and exhaust gases from a cooking equipment

3.13
indicator
mechanical or electrical device that shows when an extinguishing system or one of its critical components is ready to operate or has already operated

3.14
inspection
visual examination of the system or portion thereof to verify that it appears to be in operating condition and is free of physical damage

3.15
low quality fatty beef steak
beef steak containing 20 % to 30 % fat or gristle, well marbled and uniform in size

3.16
maintenance
work, including but not limited to repair, replacement and service, performed to ensure that the cooking equipment operates properly

3.17
manual means of actuation
means of system actuation in which a system is discharged by manual means

3.18
manufacturer's installation and maintenance manual
document containing the design, installation and maintenance instructions which is a complementary part of the extinguishing system

3.19
multiple-vat deep fat fryer
multiple electric fryers that are mechanically joined together

Note 1 to entry: Each vat incorporates a separately controlled heating source.

3.20
operating devices
mechanical, electrical or pneumatic devices involved in the operation of a system

3.21
owner's manual
pamphlet containing the manufacturer's recommendations for proper inspection and operation, which is prepared as a complementary part of the extinguishing system

3.22
plenum
volume of enclosed space between the grease filters and the portion of the *hood* (3.12) above the grease filters in a hood and *duct system* (3.8)

3.23
pre-engineered extinguishing system
system that is tested in accordance with the limitations prescribed by the manufacturer for the maximum and minimum pipe lengths, accessories, number of fittings, number and types of nozzles, nozzle placement, types of fire risk and the maximum dimensions, volumes and areas of the equipment, *hoods* (3.12) and *ducts* (3.8) to be protected

Note 1 to entry: The hazards protected by these systems are specifically limited as to type and size by testing on actual fires.

Note 2 to entry: The limitations on hazards that are permitted to be protected by these systems and piping and nozzle configurations are those contained in the *manufacturer's installation and maintenance manual* (3.18).

3.24
cylinder
container that provides storage for the expellant gas and extinguishing agent, or the extinguishing agent only when the expellant *gas cartridge* (3.11) is operated

3.25
product
fire-extinguishing system or any part thereof covered by the requirements of this document

3.26
shut-off device
device that operates simultaneously with the extinguishing system to shut off fuel and power to the equipment protected by the system and other equipment required to be shut off upon operation of the system

3.27
signal
status indication communicated by electrical or other means

3.28
split-vat deep fat fryer
electric fryer that incorporates a divided partition which splits the fryer into sections

Note 1 to entry: Each split-vat fryer incorporates a separately controlled heating source.

3.29
tilt skillet
braising pan
cooking device which is intended to braise, simmer, sauté, or fry foods

4 Components

4.1 General

System components referenced or permitted in the manufacturer's installation and maintenance manual or alternative components that are intended for use with the specific extinguishing system shall be used.

4.2 Detectors

Detectors shall be positioned for detecting fire in the galley hoods, ducts, fryers and other grease-laden cooking equipment.

4.3 Discharge nozzles

4.3.1 The nozzles shall be provided with an internal strainer located immediately up-stream of the nozzle.

4.3.2 The nozzles shall be constructed of brass, stainless-steel, or other corrosion-resistant materials, or be protected inside and out against corrosion.

4.3.3 The nozzles shall be made of non-combustible materials and shall withstand the expected fire exposure without deformation.

4.3.4 The nozzles shall be permanently marked for identification.

4.3.5 All the nozzles shall be provided with caps or other suitable devices to prevent the entrance of grease vapours, moisture, or other foreign materials into the piping.

4.3.6 The caps or other protection devices shall blow off, open or blow out upon agent discharge.

4.4 Operating devices

4.4.1 Operating devices shall be designed for the service they will encounter and shall not be rendered inoperative by, or be susceptible to, accidental operation.

4.4.2 Operating devices shall be designed to function properly through a temperature range from 0°C to 49°C; such range shall be marked to indicate the temperature limitations.

4.5 Manual means of actuation

4.5.1 Manual means of actuation shall not require a force of more than 178 N.

4.5.2 Manual means of actuation shall not require a large movement (e.g. more than 356 mm) to secure operation.

4.5.3 All manual actuators shall be provided with operating instructions. These instructions can include the use of pictographs and shall have lettering at least 6 mm in height.

4.5.4 All remote manual operating devices shall be marked to identify the associated hazards.

4.6 Shut-off devices

4.6.1 Upon activation of any cooking equipment or hood/duct fire-extinguishing system, all sources of fuel and electric power that produce heat to all equipment protected by the system shall have shut off capability.

4.6.2 Gas equipment not requiring protection but located under the same ventilation equipment shall also be shut off.

4.6.3 Exhaust fans and dampers are not required to be shut off on system actuation if the fire-extinguishing system has been tested under both zero and high-velocity flow conditions.

4.6.4 If the expellant gas is used to pneumatically operate the shut-off devices, the gas shall be sourced prior to its entry into the agent storage cylinder.

4.6.5 Shut-off devices shall require manual resetting prior to fuel or power being restored.

4.7 Pipe, fittings, tubing and hose

4.7.1 Pipe and associated fittings shall be of non-combustible material having physical and chemical characteristics compatible with the extinguishing agent.

4.7.2 The pressure rating of the pipe, fittings and connection joints shall be determined and documented to withstand the maximum expected pressure in the piping system.

4.7.3 Pipe, tubing, hose and fitting materials and types shall be in accordance with the manufacturer's installation and maintenance manual.

4.8 Extinguishing agent

4.8.1 The agent used shall be identified for the particular system in the operation and maintenance manual, as recommended by the manufacturer of the system.

4.8.2 Agents from different manufacturers shall not be mixed.

4.9 Indicator

Systems shall be provided with an audible or visual indicator to show that the system is in a ready condition or requires recharging.