

AS 3772:2020



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Pre-engineered fire protection systems for cooking equipment



AS 3772:2020

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- CSIRO
- Engineers Australia
- Fire Protection Association Australia
- National Fire Industry Association

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Pre-engineered fire protection systems for cooking equipment

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Preface

This Standard was prepared by the Standards Australia Committee FP-011, Special Hazard Fire Protection System, to supersede AS 3772 — 2008, *Fire protection of cooking areas*.

The objective of the Standard is to cover the requirements for pre-engineered fire protection systems used to protect cooking appliances and ancillary hoods and ductwork.

While this Standard has been developed with wet chemical systems as the main focus, it does not preclude the use of other agents, provided they satisfy the requirements of this Standard.

The major changes in this edition are as follows:

- (a) Specifications for electrical power supply requirements increased.
- (b) Maintenance section revised to align with AS 1851.
- (c) Terms and definitions and referenced Standards updated.

The terms “normative” and “informative” are used in Standards to define the application of the appendix to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

Statements expressed in mandatory terms in notes to tables and figures are deemed to be requirements of this Standard.

This Standard includes a commentary on some of the clauses. The commentary directly follows the relevant clause, is designated by “C” preceding the clause number and is printed in italics in a box. The commentary is for information and guidance and does not form part of the Standard.

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Pre-engineered fire protection systems for cooking equipment

Section 1 Scope and general

1.1 Scope

This Standard sets out requirements for the design, installation commissioning and maintenance of pre-engineered fire protection systems for the protection of unenclosed cooking appliances that produce grease-laden vapours and which may have an open surface of cooking oil or fat. This Standard also applies to the grease removal devices, hood exhaust plenums, exhaust systems, ducts and filters associated with such appliances.

General fire safety requirements for kitchens and cooking areas are included.

Protection of enclosed ovens, water boilers and similar appliances are excluded from the scope of this Standard.

NOTE 1 Requirements for areas protected by sprinklers are given in AS 2118.1.

NOTE 2 Requirements for engineered fire protection systems such as carbon dioxide and water mist, are given in other Australian Standards referenced in AS 4158 and AS 6183.

NOTE 3 Examples of equipment this Standard covers are —

- (a) deep fryers;
- (b) griddles;
- (c) grillers;
- (d) range tops;
- (e) broilers;
- (f) woks;
- (g) tilting skillets;
- (h) salamanders; and
- (i) brazing pans.

1.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

NOTE Documents for informative purposes are listed in the Bibliography.

AS 1319, *Safety signs for the occupational environment*

AS 1670.1, *Fire detection, warning, control and intercom systems — System design, installation and commissioning, Part 1: Fire*

AS 1851, *Routine service of fire protection systems and equipment*

AS 2030.1, *Gas cylinders, Part 1: General requirements*

AS 2444, *Portable fire extinguishers and fire blankets — Selection and location*

AS 2470, *Steel cylinders for compressed gases — Welded three-piece construction with longitudinal joint — 11 kg to 150 kg*

AS 3745, *Planning for emergencies in facilities*

AS/NZS 3000, *Electrical installations (known as the Australian/New Zealand Wiring Rules)*

AS/NZS 3013, *Electrical installations — Classification of the fire and mechanical performance of wiring system elements*

AS/NZS 3504, *Fire blankets*

AS/NZS 3509, *LP Gas fuel vessels for automotive use*

AS/NZS 4029, *Stationary batteries — Lead-acid, Part 2: Valve-regulated type (IEC 60896-2:1995, MOD)*

AS/NZS 5601.1, *Gas installations, Part 1: General installations*

NFPA 17, *Standard for Dry Chemical Extinguishing Systems*

NFPA 17A, *Standard for Wet Chemical Extinguishing Systems*

UL 300, *Standard for Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment*

1.3 Terms and definitions

1.3.1

competent person

person who has acquired through training, qualifications or experience, or a combination of these, the knowledge and skills enabling that person to perform the task required

1.3.2

defect classification and non-conformance

1.3.2.1

critical defect

defect that renders a system inoperative

Note 1 to entry: An example of a critical defect includes a wet chemical system which is unable to provide suppression.

1.3.2.2

non-conformance

missing information or incorrect feature that does not affect the system operation but is required to facilitate ongoing routine service

Note 1 to entry: Examples of non-conformance include missing or incorrect system block plan as required, missing equipment location signs or illegible labels and no availability of required information required to validate a service activity.

1.3.2.3

non-critical defect

system impairment or faulty component not likely to critically affect the operation of the system

Note 1 to entry: Examples of non-critical defects include, local alarm bell not operating.

1.3.3

listed

equipment, materials, or services included in a list published by an organization (the listing authority) that is acceptable to the relevant authority and concerned with evaluation of products or services, and which maintains periodic inspection of production or listed equipment or materials or periodic evaluation of services and whose listing states that either the equipment, material, or service meets appropriate designated Standards or has been tested and found suitable for a specified purpose

Note 1 to entry: Examples of recognized testing and approval bodies are organizations accredited by JAS-ANZ, CSIRO Actifire, Factory Mutual (FM), Loss Prevention Certification Board (LPCB), SP Technical Research Institute of Sweden, Underwriters Laboratories (UL) and Verband der Schadenverhütung (VdS).

Note 2 to entry: A manufacturer's statement of conformance does not by itself confirm that a system has been listed. The relevant authority should seek evidence of conformity to demonstrate that the system has been independently verified as being appropriate for the intended application.

1.3.4

pre-engineered fire protection systems

fire protection system consisting of a supply of extinguishing agent of a predetermined quantity coupled to pipework with nozzle arrangement installed up to a maximum permitted design

Note 1 to entry: The hazards protected by these systems are specifically limited as to type and size by a testing laboratory, based on actual fire tests.

1.3.5

relevant authority

agency authorized by legislation or regulation to issue determinations, orders, or other instructions in respect of any subject covered by this Standard

Note 1 to entry: For example —

- (a) a Minister of the Crown;
- (b) a government department;
- (c) other public authority having power to issue regulations, orders or other instructions having the force of the law in respect of any subject covered by this Standard; or
- (d) in cases where none of these apply, the owner or the owner's agent.

1.3.6

responsible entity

entity responsible for the routine service of the fire protection systems and equipment

Note 1 to entry: Typically the building owner, the building occupier or the building owner's agent.

1.3.7

shall

indicates that a statement is mandatory

1.3.8

should

indicates a recommendation

1.3.9

wet chemical

aqueous solution of organic or inorganic salts, or a combination thereof, that forms an extinguishing agent

1.4 Wet chemical systems

Wet chemical systems shall be in accordance with [Appendix A](#).

1.5 Competencies

Design, installation and maintenance of fire protection systems and equipment shall be conducted by competent persons.

NOTE 1 Relevant state and territory authorities may share guidelines for determining competence, for example, appropriate Australian Qualifications Framework competencies (AQF) or state licence where these exist.

Additionally, manufacturer's training shall be successfully completed.

NOTE 2 For guidance on competencies, see [Appendix B](#).

Section 2 Safety requirements

2.1 Emergency procedures

Procedures, in accordance with AS 3745, shall be in place to manage the safety of personnel in the event of fire. Personnel shall be trained in emergency procedures.

2.2 Signs and warning notices

2.2.1 General

Hoods, ductwork and appliances fitted with a fire protection system shall be fitted with a warning notice advising that a fire protection system is fitted. The fire protection system may operate automatically and shut off power or fuel to the appliances.

All safety signs and warning notices shall be designed and installed in accordance with AS 1319. Safety signs and warning notices shall be —

- (a) of durable, corrosion-resistant construction;
- (b) permanently attached; and
- (c) positioned so they are clearly visible.

NOTE [Figure 2.2.1](#) gives an example of a warning notice.



Figure 2.2.1 — Example of a warning notice for fire protection systems

2.2.2 Manual release instruction notice

Manual release instruction notices shall be provided at each manual release point.

Manual release instruction notices shall use white lettering on a red background.

NOTE 1 Requirements for manual actuators are set out in [Clause 7.4.2](#).

NOTE 2 [Figure 2.2.2](#) provides an example of a manual release instruction notice.

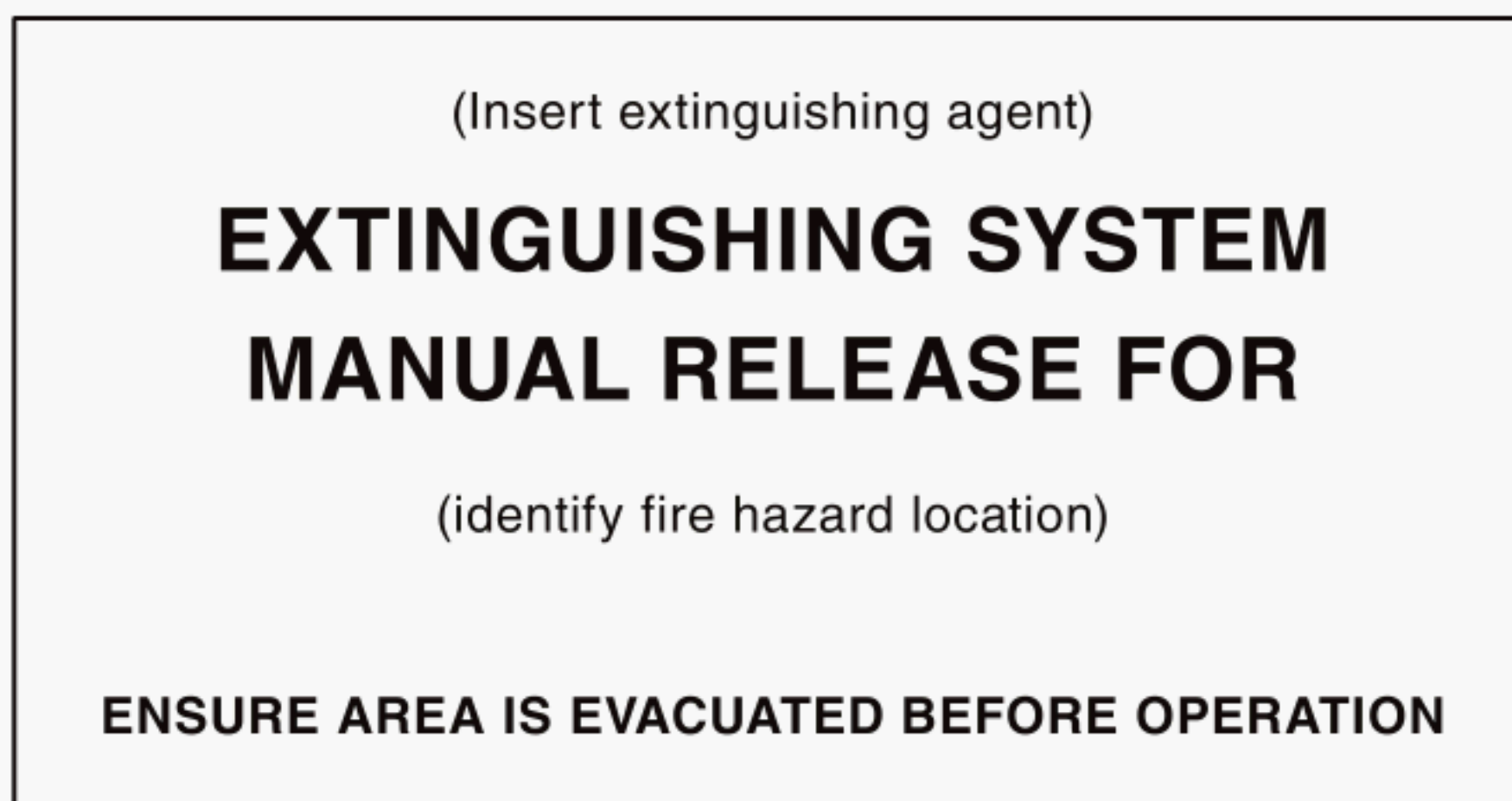


Figure 2.2.2 — Example of manual release instruction notice to be displayed at the manual release

2.3 Fire extinguishers

2.3.1 General

Fire extinguishers shall be —

- (a) selected and installed as required by AS 2444, and
- (b) in no case less than that required by the relevant authority.

The installation of fixed fire suppression systems shall not eliminate the need for a portable fire extinguisher.

All portable fire extinguishers shall be maintained in accordance with AS 1851.

2.3.2 Operator training

The operator shall be competent in the use of fire extinguisher(s). Competence in extinguisher use shall take into account the —

- (a) type of equipment;
- (b) area of operation;
- (c) type of extinguisher; and
- (d) type of any fire protection system fitted.

***C2.3.2** Extinguishers are most effective when used by trained operators; however, considering the size and configuration of equipment, fires can be difficult, impossible or dangerous to fight with a hand-held extinguisher. The key to operator protection is early detection of fires to provide warning to the operator, shut-off of the power or fuel supply to the cooking appliances and fire suppression during early stages of a fire.*

If a fire protection system is not fitted, competent persons shall be present when kitchen equipment is in operation who can intervene if there is an outbreak of a fire.

NOTE 1 Examples of intervention include raising an alarm, shutting off power or fuel supplies, or attempting to extinguish the fire.

NOTE 2 Appropriate training should be carried out by a registered training organization.

2.4 Fire blankets

Kitchens and cooking areas shall be equipped with a fire blanket conforming to AS/NZS 3504.

Section 3 Documentation

3.1 General

System documentation shall be provided. The documentation shall clearly identify the hazard location(s) protected by the system. The documentation shall include, but not necessarily be limited to, the information specified in [Section 3](#) and be in accordance with the following:

- (a) *Prior to installation* — A general description of the system configuration and operation shall be provided. The description shall include —
 - (i) scope of protection;
 - (ii) summary of major system components; and
 - (iii) any required modifications to the cooking equipment.
- (b) *When any change is made to the initial design* — Where field conditions necessitate any change from the approved plan, the as-installed plans and documentation shall be revised and submitted to the relevant authority. An example of a substantial change would be additional bends in the agent distribution pipe, additional agent distribution pipe, changes in location of nozzles, changes in location of detectors, etc.
- (c) *As part of commissioning* — All the documentation specified in [Clauses 3.2](#) to [3.6](#) of the as-installed system shall be provided.

Documentation for maintenance shall be in accordance with [Section 9](#).

3.2 Identification

The system documentation shall include the following:

- (a) Name and address of owner/client.
- (b) Name and address of installer.
- (c) Name of designer.
- (d) Design documentation reference.
- (e) Name, address and location of protected area.
- (f) System and listing identification.

3.3 Design

Design documentation shall include the following:

- (a) Type of fire protection system installed.
- (b) Indication of the design parameters, including —
 - (i) interfaces with equipment;
 - (ii) air-handling shutdown;
 - (iii) power shut-off; and
 - (iv) fuel shut-off.
- (c) Date of remote-monitoring connection.

- (d) Suppression system details, including —
 - (i) protected location;
 - (ii) brand and specification of agent;
 - (iii) quantity of agent;
 - (iv) method of agent quantity calculation;
 - (v) storage pressure;
 - (vi) number, capacity and location of agent cylinders;
 - (vii) type and size of container valve;
 - (viii) number of nozzles;
 - (ix) details of the nozzles by type, size and orifice;
 - (x) specific items of equipment protected by each nozzle; and
 - (xi) specification of hose, tube, pipe and fittings.
- (e) General arrangement drawings showing the layout of the system and detailing the location of major components, see Items (d) and (g).
- (f) The area of coverage provided by the fire protection system design, including —
 - (i) system configuration of the automatic and manual release;
 - (ii) the functional sequence of events;
 - (iii) fire protection system interface with the equipment; and
 - (iv) shutdowns and time delays.
- (g) Detection and control, including —
 - (i) type of detection;
 - (ii) specific area protected and location of detectors;
 - (iii) actuator location;
 - (iv) actuator type; and
 - (v) single line diagram showing detection, control, and alarm circuits and shutdown interfaces.

3.4 Plans

Schematics shall be provided.

Schematics shall include the following:

- (a) The location and function of detection devices, manual controls and auxiliary equipment.
- (b) Size, length, and arrangement of connected pipework, pipe hangers and their spacing.
- (c) A description and location of nozzles and containers.
- (d) Operating devices.
- (e) Auxiliary equipment.

- (f) Electrical circuitry.

3.5 Commissioning

Documentation shall detail the commissioning of the system in accordance with [Section 8](#) and the following:

- (a) Name of the agent who conducted the commissioning test(s).
- (b) Name of a witness to the commissioning test(s).
- (c) Date of commissioning test(s).
- (d) Date of completion.
- (e) A certificate of completion to the relevant authority that the installation is in accordance with AS 3772:2020 and the terms of the listing.
- (f) Where variations have been previously accepted by the relevant authority, a statement to this effect, plus a listing of the variations in an attachment.

NOTE 1 [Appendix D](#) gives an example of a certificate of completion.

NOTE 2 Clause references should be included.

3.6 System owner's manual

A system owner's manual shall be provided, giving instructions on the operation and maintenance of the system. The system owner's manual shall detail —

- (a) all components and part numbers;
- (b) technical data sheets;
- (c) Safety Data Sheets;
- (d) the recommended maintenance practices and procedures; and
- (e) a copy of the commissioning certificate of completion.

Section 4 System design

4.1 General

Pre-engineered fire protection systems for cooking equipment shall —

- (a) provide fire protection for the exhaust hood, ductwork and cooking appliances as specified in this Standard;
- (b) be tested and listed to UL 300, or other equivalent Standard(s), as determined by the listing authority;
- (c) be installed in accordance with the requirements of the listing and the manufacturer's listed manual; and
- (d) include automatic activation as an integral part of their listing.

Water wash systems in fixed baffle hoods, specifically listed to extinguish a fire, shall be activated by the cooking equipment fire protection system.

***C4.1** Water wash hoods utilize water spray nozzles in the exhaust plenum to clean the grease collected by the filtration system after a certain period of operation. Some types of water wash systems use continuous water mist to extinguish embers on a solid fuel cooking operation.*

4.2 Approval of components

System components shall form part of the fire protection system's listing.

NOTE Legislation may require that ancillary components such as gas shut-off valves be substituted for listed components, subject to the approval of the relevant authority.

4.3 Moveable cooking appliances

Moveable cooking appliances shall be provided with a fire protection system that covers the area in which the appliance can be repositioned. A warning notice shall be provided advising of loss of fire protection if the moveable cooking appliance is moved beyond the protected area.

NOTE [Figure 4.3](#) provides an example of a typical warning notice for moveable cooking appliances.



Figure 4.3 — Example of a warning notice for moveable cooking appliances

4.4 Design and calculations

4.4.1 General

The fire protection system design shall be prepared in accordance with the manufacturer's listed manual. The design shall address the type, size and location of —

- (a) nozzles;
- (b) pipes;
- (c) detectors; and
- (d) storage containers.

The design shall be based on the preliminary data listed in [Clause 4.4.2](#).

All system calculations shall be carried out using the method specified in the manufacturer's listed manual and in accordance with the manufacturer's listed limitations.

4.4.2 Preliminary data

Preliminary data in relation to the area to be protected shall include —

- (a) physical dimensions, including —
 - (i) exhaust duct;
 - (ii) hood;
 - (iii) plenum area; and
 - (iv) appliance cooking surface;
- (b) type of cooking appliances;
- (c) whether the cooking appliance is fixed or moveable;
- (d) energy sources, including electric, gas, solid fuel type; and
- (e) air-handling equipment.

4.5 Extinguishing agent quantity

The amount of extinguishing agent in the system shall be sufficient for the largest single hazard or group of hazards that are to be protected simultaneously. Extinguishing agent quantity shall be determined using the listed manual.

4.6 Fuel Shut-off

4.6.1 General

The following shall apply for fuel shutoff:

- (a) Upon activation of the fire protection system, all sources of fuel and electric power that produce heat to appliances requiring protection by that system shall automatically shut-off.
- (b) Any gas appliance not requiring protection, but located under the same ventilating equipment, shall also automatically shut-off upon activation of any extinguishing system.
- (c) Shut-off devices shall require manual resetting.

Steam supplied from an external source is not required to automatically shutoff.

4.6.2 Gas shut-off controls

In systems where automatic gas shut-off occurs, measures shall be provided to prevent the release of unignited gas upon restoration of supply.

Gas shutoff valves shall conform to the requirements of AS/NZS 5601.1 for gas shut-off when automatic fire equipment operates.

NOTE 1 Gas supply authorities may have additional requirements.

NOTE 2 Examples of suitable measures include flame safeguarding of all burners or a burner shut-off system incorporating the automatic shut-off valve.

4.7 Components

Where two or more hazards can be simultaneously involved in fire by reason of their proximity, the hazards shall be protected by either —

- (a) individual systems installed to operate simultaneously; or
- (b) a single system designed to protect all hazards that can be simultaneously involved.

Simultaneous operation is not required where dry or wet chemical systems protect common exhaust ductwork by one of the methods specified in NFPA 17, or NFPA 17A.

For back to back hoods with common ducting, where two or more hoods are joined using a common plenum and duct, then they shall be treated as a single risk.

4.8 Water supplies

4.8.1 General

Where a pre-engineered kitchen suppression system requires an external water supply, the supply shall be from a reliable source that can provide the required flow and pressure for the system discharge duration. The water supply shall also be sufficient to supply any other simultaneous demands connected to the supply.

4.8.2 Water valve supervision

A valve controlling the water supply to listed fixed baffle hood assemblies, automatic fire-extinguishing systems, or both, shall be —

- (a) a listed valve that includes a visual means of indicating whether the valve is opened or closed; and
- (b) supervised open by —
 - (i) means of an audible alarm a central station, proprietary, or remote station alarm service if the valve is in the closed position;
 - (ii) a local alarm service that will cause the sounding of an audible signal at a constantly attended point;
 - (iii) locking valves open; or
 - (iv) sealing of valves and weekly recorded inspection.

Section 5 Supply

5.1 Extinguishing agent

The type of extinguishing agent used in the system shall be listed for the particular system.

Extinguishing agents of different formulations or different manufacturers shall not be mixed.

5.2 Storage containers

5.2.1 General

Storage containers shall —

- (a) be designed and approved to hold the specific extinguishing agent;
- (b) be of a suitable material to resist environmental conditions such as corrosion;
- (c) conform to AS 2030.1, AS 2470 or AS/NZS 3509 as appropriate; and

NOTE Storage containers may be subject to additional regulatory requirements.

- (d) not be charged to a fill-density greater than manufacturer's specifications.

Stored pressure containers, other than those for CO₂ or expellant cartridges, shall be fitted with a pressure indicator capable of indicating the correct content pressure to an accuracy of $\pm 10\%$.

5.2.2 Location and arrangement

Storage containers and accessories shall be located in accordance with a listed manual. Where cylinders are located in a concealed space, suitable access points shall be provided and identified.

NOTE Storage containers and accessories should be located in such a way as to make inspection, testing, recharging and maintenance easier.

Storage containers shall be located in accordance with the following:

- (a) Containers and expellant gas assemblies shall be located within the temperature range specified in a listed manual.
- (b) If ambient temperatures outside the manufacturer's operating temperature range are expected, protection shall be provided to maintain the temperature within the listed range.
- (c) Containers and expellant gas assemblies shall not be located where they could be subjected to mechanical, chemical, or other damage.
- (d) Where damage due to chemical or mechanical exposure is expected, protective devices such as enclosures or guards acceptable to the relevant authority shall be provided.
- (e) Containers and expellant gas assemblies shall be located near the hazard or hazards protected. They shall not be located where they will be exposed to the fire from the protected hazard.

5.2.3 Labelling

The following information shall be displayed on the container:

- (a) Manufacturer's or distributor's name or trademark and contact details.
- (b) Part number, description and type of extinguishing agent.
- (c) Mass or volume of extinguishing agent.

- (d) Refill instructions.
- (e) Charge pressure and temperature of the container.
- (f) Any other cautionary safety statement required.

Section 6 Distribution systems

6.1 General

The size and arrangement of distribution systems including hose lengths, nozzle and fitting orientation shall be in accordance with the listed manual.

Installation of systems shall be performed only by competent persons in relation to the specific system being provided.

6.2 Pipework

6.2.1 General

Pipework shall be designed and installed in accordance with the manufacturer's listed manual and the requirements of this Standard, including the following:

- (a) The pipework and all pipe fittings shall have pressure ratings equal to or greater than the maximum developed pressure in the containers.
- (b) All pipework and devices, including nozzles, shall be so installed or protected as to reduce the risk of mechanical, chemical, environmental, or other damage to the system by the normal operation of the kitchen.

6.2.2 Materials

Pipe or tubing shall be steel, stainless steel, copper, or brass. Fittings shall be galvanized steel, stainless steel, copper, brass, or galvanized malleable iron, as appropriate for the extinguishing agent.

Galvanized steel, copper, or brass pipe and fittings shall not be used in wet chemical systems.

NOTE 1 Health regulations do not permit the use of unplated steel, copper, or brass in exposed positions in kitchens.

NOTE 2 Choice of materials is dependent on compatibility with the extinguishing agent and should be selected in accordance with system manufacturer's manual.

6.2.3 Penetrations

Where the pipe or other conduit penetrates a duct or hood, the penetration shall be sealed by a liquid tight device (e.g. a bulk head fitting).

6.3 Nozzles

6.3.1 General

Nozzles shall be selected in accordance with the manufacturer's listed manual.

Wet chemical discharge nozzles shall be provided with an internal strainer or a separate listed strainer located immediately upstream of the nozzle.

6.3.2 Positioning and location

Positioning of nozzles shall be in accordance with the manufacturer's listed manual. The nozzles shall be so aimed as to ensure that they do not cause the splashing of hot or burning oil during discharge.

NOTE Directing nozzles towards personnel could cause splashing and is likely to be hazardous.

All discharge nozzles shall be located, or protected, so that they are not subject to mechanical, environmental, or other conditions that could render them inoperative.

The nozzles shall be located so as to protect the following hazard areas:

- (a) Duct or duct entrance.
- (b) Plenum, except where the plenum is protected with a water wash system specifically listed to extinguish a fire.
- (c) Cooking appliances.

6.3.3 Materials

Discharge nozzles shall be compatible with the extinguishing agent. They shall be manufactured from —

- (a) brass;
- (b) stainless steel;
- (c) plated steel; or
- (d) other metals that are either —
 - (i) protected against corrosion inside and out; or
 - (ii) equivalent to Grade 304 stainless steel.

6.3.4 Installation

Discharge nozzles shall be fixed to prevent accidental misalignment.

6.3.5 Marking

Discharge nozzles shall be clearly and permanently marked to allow easy identification of type and size or orifice code where appropriate.

6.3.6 Protective caps and plugs

All discharge nozzles shall be provided with listed caps, plugs, or other suitable devices to prevent the entrance of grease vapours, moisture, or other foreign materials into the piping. This device shall —

- (a) blow off, open, or blow out upon extinguishing agent discharge;
- (b) be listed as having demonstrated that its performance, or that of the nozzle is not impaired by the operating environment, effects of fire or thermal degradation.

Section 7 Detection, actuation and controls

7.1 General

Automatic detection and control systems shall be in accordance with the listed manual.

All devices necessary for proper operation of the system shall function simultaneously with the system operation.

7.2 Electrical wiring and equipment

Electrical wiring and equipment shall be installed in accordance with AS/NZS 3000 and AS/NZS 3013.

7.3 Detection

Detectors shall be installed as follows:

- (a) A detector shall be provided above each protected cooking appliance or in accordance with the extinguishing system manufacturer's listed manual.
- (b) At least one detector shall be installed within each exhaust duct opening, in accordance with the manufacturer's listed manual.

NOTE Detectors located at, or within 300 mm into, the exhaust duct opening and above the protected appliance may cover cooking appliances located immediately below the duct opening.

- (c) Detectors may be installed either above or below filter banks. Where detectors are concealed, they shall be accessible to permit their identification and maintenance.
- (d) In accordance with the detector manufacturer's listed design and installation manual.

7.4 System actuation

7.4.1 General

Means of manual actuation of the fire protection system shall be provided in accordance with [Clause 7.4.2](#). Operation of any manual actuator shall be the only means to bring about the full operation of the system.

Systems shall be capable of both automatic and manual operation.

The automatic and manual means of system actuation, external to the control head or releasing device, shall be separate and independent of each other so that a failure of one will not impair the operation of the other.

The manual means of system activation may be part of the same arrangement or sub-system of the automatic means if the manual activation device is located between the control head or releasing device and the first detector.

7.4.2 Manual actuation

Manual actuation of the fire protection systems shall be in accordance with the following:

- (a) At least one manual actuator shall be provided for each system.
- (b) A readily accessible means for manual activation shall be located in a path of egress.
- (c) At least one manual control shall be located not more than 1500 mm above the floor, and be conveniently and easily accessible at all times. Such controls shall be situated outside the boundary of the exhaust hood and on an exit path from the cooking area.

- (d) Unless a reserve or supervised electrical power supply is provided (see [Clause 7.5.2](#)), manual actuation shall be by mechanical means.

7.4.3 Manual actuators

Manual actuators shall —

- (a) not require a force of more than 180 N;
- (b) not require a movement of more than 360 mm to ensure operation; and
- (c) be provided with an operating instruction notice that identifies the protected hazards, with lettering at least 7 mm in height.

NOTE 1 [Figure 7.4.3](#) provides an example of an instruction notice to identify protected hazards.

NOTE 2 These instructions may also include pictographs.

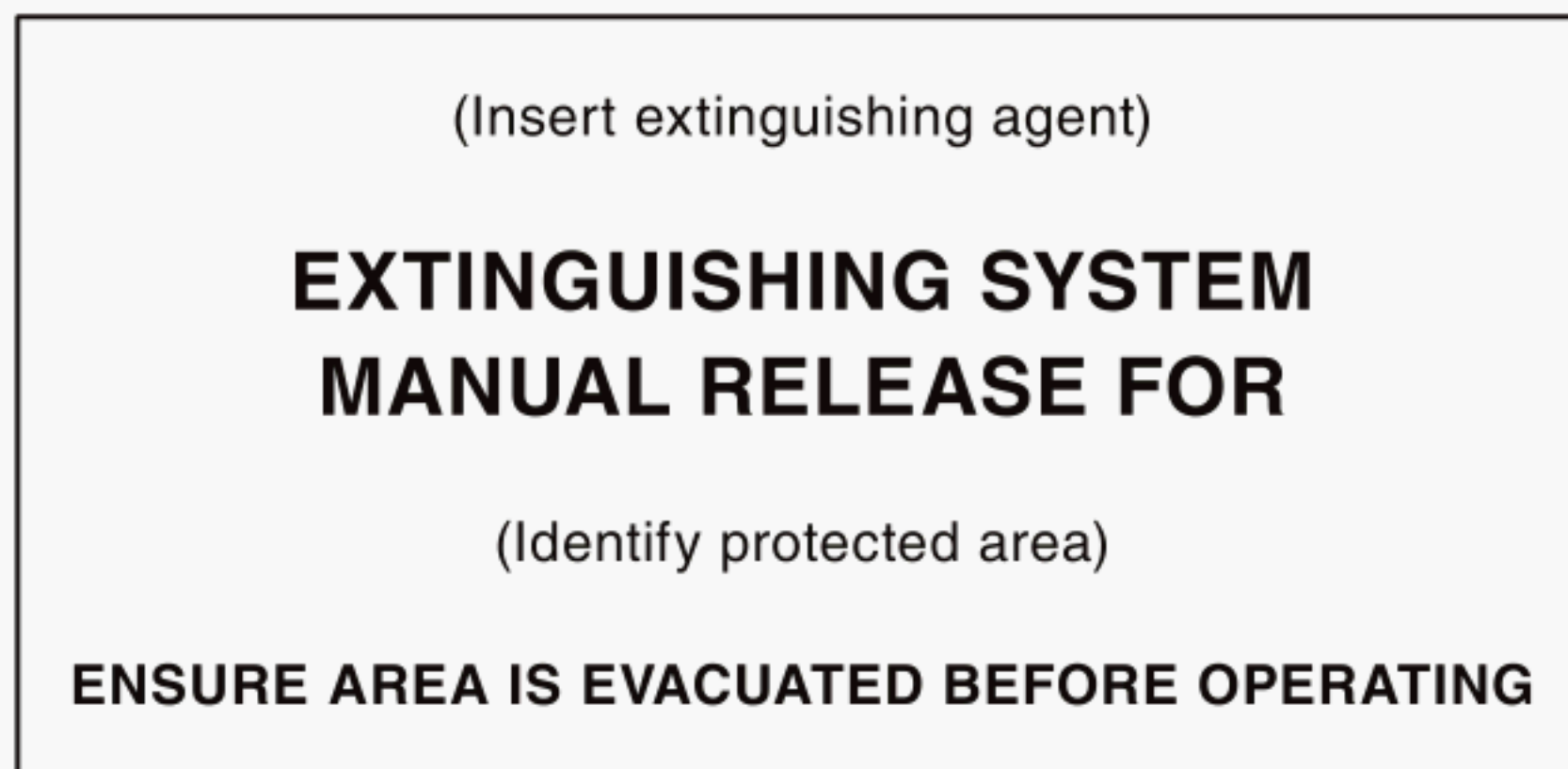


Figure 7.4.3 — Example of an instruction notice to be displayed at the manual release

7.5 Control and indicating equipment

7.5.1 General

Control and indicating equipment shall conform to the following:

- (a) Excluding reserve systems, the operation of the system detectors or manual actuators shall be the only means to bring about the full response of the system, including the complete discharge of all extinguishing agent containers.
- (b) Both manual and automatic operation of the fire-extinguishing system shall cause the shut-off of all energy sources to or within the cooking equipment. Such operation shall also initiate alarms, and cause the shut-off of any associated devices such as extraction/exhaust fans as may be required by this Standard.

NOTE 1 A risk assessment may be needed prior to determining shut down sequences for exhaust fans.

- (c) The extinguishing system shall be connected to the fire alarm system, where provided, so that the actuation of the extinguishing system will sound the fire alarm.

NOTE 2 Where power failure may cause the ventilation system in the exhaust duct to shut down, consideration should be given to interlocking the fuel supply to prevent undesired system discharge as a result of sudden increase of temperatures in the hazard area.

- (d) A control and detection system that forms parts of a listed pre-engineered kitchen suppression systems shall be installed and maintained as per the manufacturer's listed design and installation manual.

7.5.2 System monitoring

Where electrical power is required to operate the automatic fire-extinguishing system —

- (a) it shall be monitored;
- (b) a fault indication shall indicate if electrical power fails; and
- (c) it shall be provided with a stand-by power supply.

A standby power supply should be provided, see [Clause 7.5.3](#).

System monitoring shall give distinctive audible and visual indication when faults occur in any of the following:

- (i) Automatic detection system.
- (ii) Electrical actuation circuit.
- (iii) Electrical power supply.

7.5.3 Standby power source capacity

The capacity of the standby power source shall be such that, in the event of failure of the primary power source, the standby power source is capable of maintaining the system in normal working (quiescent) condition for at least 72 h, after which sufficient capacity remains to operate the load determined in AS 1670.1 for 30 min.

Where the power supply failure signal is externally monitored the minimum requirement is reduced to 24 h.

Where the standby power source is a battery it shall consist of rechargeable stationary batteries, in accordance with the relevant part of AS/NZS 4029 or listed in the Control and Indicating Equipment (CIE) certification documentation referred to in AS 1670.1. The battery capacity shall be calculated in accordance with AS 1670.1.

Pre-engineered kitchen suppression systems that utilize an integrated control and detection system shall be supplied with back-up power or batteries provided as per the manufacturer's listed design and installation manual. Battery replacement shall be in accordance with the listed manual.

Section 8 Commissioning and acceptance

8.1 General

The fire protection system shall be commissioned in accordance with the manufacturer's listed manual.

The commissioning procedures shall demonstrate system integrity, functionality and conformance to system design documentation.

8.2 Preliminary review

The as-installed system shall be reviewed to verify conformance to the system design documentation and manufacturer's listed manual.

8.3 System function and operation test

To ensure that the system has been properly installed and will function as specified, the correct operation of all components, including the following shall be confirmed:

- (a) Fire detection system.
- (b) Audible and visual fire detection and discharge alarms.
- (c) Visual evacuation and warning devices.
- (d) Cooking appliance power or fuel shut-off devices.
- (e) Ventilation system shutdown devices.
- (f) Actuation components.
- (g) Manual release devices.

NOTE [Appendix C](#) gives an example of a commissioning checklist.

8.4 Discharge test

A full discharge test is not required provided full system function testing is completed.

When a discharge test is required, it shall be conducted in accordance with the manufacturer's listed manual.

8.5 Placing in service

Following functional testing, the system shall be restored to operational condition in accordance with the manufacturer's listed manual.

8.6 Certificate of completion and documentation

System documentation shall be completed (see [Section 3](#)).

A certificate of completion shall be provided to the relevant authority [see [Clause 3.5\(e\)](#)]. All system documentation, including but not necessarily limited to the information set out in [Section 3](#), shall be provided with the certificate of completion.

Section 9 Maintenance

9.1 General

A maintenance program shall be carried out to provide a means to —

- (a) continuously preserve the function and performance of fire protection systems and equipment; and
- (b) demonstrate that fire protection systems and equipment interfaces operate and are capable of performing to a standard not less than that to which they were originally designed.

Systems inspection, testing, and maintenance shall be in accordance with the manufacturer's manual

Systems inspection, testing, and maintenance shall be, as a minimum, in accordance with [Tables 9.2, 9.3, 9.4 and 9.5](#).

9.2 Maintenance personnel

Maintenance of fire protection systems shall be performed by competent persons.

NOTE Competent persons should be accredited to the level required for the service being conducted.

9.3 Maintenance records

9.3.1 General

Records shall be retained and shall include details of —

- (a) maintenance record activities;
- (b) defects;
- (c) rectifications and by whom;
- (d) date conducted;
- (e) condition report; and
- (f) design survey.

9.3.2 Condition report

A system condition report shall be completed on a six monthly and shall be submitted to the equipment owner within one month of the scheduled maintenance being performed.

The system condition report shall contain the results of all procedures specified in [Tables 9.2, 9.3, 9.4 and 9.5](#).

NOTE A sample system condition report is shown in [Appendix E](#).

9.4 Procedures and precautions

9.4.1 General

Prior to commencing any inspection, testing or other maintenance, the following shall be carried out:

- (a) The owner or agent shall be informed that maintenance is to be carried out.

- (b) The system shall be disabled to prevent testing or other maintenance from causing discharge of any extinguishing agent.
- (c) Where access to the system for maintenance requires the opening of panels in ducts, the appliance(s) or equipment that the system protects shall be shut down during access.

On completion of any inspection, testing or other maintenance, the system shall be restored to its normal operating condition.

9.4.2 Recharge of extinguishing agent

Only the extinguishing agent detailed in the system listing shall be used to recharge the system.

9.4.3 Defects

The responsible entity shall be notified of critical defects before leaving site, or where this cannot be achieved, as soon as possible. Critical defects shall be confirmed in writing within 24 h of the defect identification and reconfirmed each time the defect is identified.

The responsible entity shall be notified of non-critical defects, non-conformances and out of tolerance activities within one week.

NOTE 1 The full report should be submitted as soon as practicable, thereafter.

NOTE 2 A recommendation should be sent to the responsible entity that critical defects be rectified with the minimum of delay, non-critical defects and non-conformances be rectified as soon as practicable prior to the next yearly condition report.

9.5 Design survey

A design survey shall be undertaken to determine whether —

- (a) the system will perform as it is intended to the design at the time of commissioning or recommissioning;
- (b) scheduled maintenance has been carried out; and
- (c) neither the fire protection system nor the equipment being protected has changed from the system documentation (for example, obstructions to nozzles or fire protection system component changes).

The design survey shall compare the installation against the approved design for any alterations, changes in use or operating environment, or other factors that could adversely affect the fire protection system.

NOTE The design survey together with the inspection, test and preventive maintenance regime demonstrates that the fire protection systems (or equipment) are functional and capable of performing to a standard not less than that to which they were originally designed. A further goal is to determine that the system is not compromised by alterations that have been made to the cooking equipment. Where a system upgrade has resulted in a change of the performance capability, the system should be appraised together with the upgraded level of performance.

9.6 Inspection schedules

Inspection of fire protection systems shall be carried out in accordance with [Table 9.2](#), [9.3](#), [9.4](#) and [9.5](#).

The tolerances which apply to the service activity frequencies are listed in [Table 9.1](#). These tolerances shall be applied to the scheduled date of the initial activity.

Table 9.1 — Service frequency tolerances

Frequency	Tolerance
Six-monthly	±1 month
Yearly	±2 months
Five-yearly	±3 months

Table 9.2 — Monthly routine service schedule

Item No.	Item	Action required and pass/fail requirement	Result	Pass/fail	Comments
1.1	Detection system	Electric detection system (where fitted): Check detectors, wiring, connection and supports are intact, not damaged and detectors are in position.			

NOTE Pre-engineered kitchen suppression systems with an integrated control and detection system shall be tested at the frequency required by the manufacturer's listed design and installation manual.

Table 9.3 — Six-monthly routine service schedule

Item No.	Item	Action required and pass/fail requirement	Result	Pass/fail	Comments
2.1	Monthly service	Complete all monthly routine service activities detailed in Table 9.2			
2.2	Storage container pressure	Check all container pressure indicators are visible and read within normal range. Where there is no container pressure indicator, check that the system discharge indicator has not operated.			
2.3	Manual actuators	(a) Check that all release anti-tamper seals/pull pins are in place and secure.			
		(b) Check that all actuators are secure, clean, undamaged and accessible.			
2.4	System control and indicating equipment (where fitted)	(a) Check that all indicators show normal condition.			
		(b) Check that all panels are secure, clean, undamaged and accessible.			
		Batteries as per listed manual			

Table 9.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Result	Pass/fail	Comments
2.5	Distribution system	(a) Check nozzle caps and plugs are in place. If not, clean nozzle and replace caps.			
		(b) Check nozzles are pointing at pre-determined aiming points.			
		(c) Check distribution system, (hoses, tube, fittings and supports) are intact and not damaged.			
2.6	Actuation system	(a) Pneumatic actuation system (where fitted): Check hoses, tube, fittings and supports are intact and not damaged. Check actuation cartridges for correct weight.			
		(b) Electric actuation system (if fitted): Check wiring, connections and supports are intact and not damaged.			
2.7	Mechanical Detection system	Check and clean detection hoses, tube, fusible links, cables, pneumatic detection devices, fittings and supports (where fitted), are intact and not damaged and are in position.			
2.8	Labels	Check manual release, system warning and instruction labels are securely in place, visible and legible.			

Table 9.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Result	Pass/fail	Comments
2.9	Storage containers	(a) Check storage containers and valves are not damaged.			
		(b) Check storage container and mounting bracket are secure.			
		(c) Check storage container label is securely in place, visible and legible.			
		(d) Check container storage is properly filled. Measurement can be by weight.			
2.10	Manual actuators	(a) Physically check that all actuators are secure, clean, undamaged and accessible.			
		(b) Test operation.			
		(c) Check contents of actuator cartridges (where fitted).gkPa		
2.11	System control and indicating equipment (where fitted)	(a) Test all indicators and audible alarms.			
		(b) Physically check that all panels are secure.			
		(c) Test battery capacity (if fitted) (see Note 1).			
2.12	Distribution system	Conduct clear-passage test by using dry nitrogen to confirm that the distribution system is not blocked.			
2.13	Detector sensing element with a listed lifetime	Replace any detector-sensing element that will exceed its listed lifetime prior to the next scheduled maintenance.			
2.14	Pyrotechnic actuators	Replace any actuator that will exceed its listed lifetime prior to the next scheduled maintenance.			
2.15	Mechanical actuator	Service and lubricate all mechanical actuators in accordance with the manufacturer's recommendations.			

Table 9.3 (continued)

Item No.	Item	Action required and pass/fail requirement	Result	Pass/fail	Comments
2.16	Nozzles	Remove all nozzle caps and plugs, clean nozzles and refit caps (see Note 2).			
2.17	Strainers, filters, mechanical detectors, and check valves (where fitted)	Where fitted, check and clean line strainers, filters, mechanical detectors and check for correct orientation of check valves.			

NOTE 1 Pre-engineered kitchen suppression systems with an integrated control and detection system shall have batteries checked or replaced at the frequency required by the manufacturer's listed design and installation manual.

NOTE 2 In certain environments more frequent cleaning may be required.

Table 9.4 — Yearly routine service schedule

Item No.	Item	Action required and pass/fail requirements	Result	Pass/fail	Comments
3.1	Six-monthly service	Complete all six-monthly routine service activities detailed in Table 9.3			
3.2	Actuation system	(a) Pneumatic actuation system (if fitted):			
		(i) Test pneumatic circuits for leaks.			
		(ii) Physically check that hoses, tube, fittings and supports are secure.			
		(b) Electric actuation system (where fitted):			
		(i) Function test all actuation circuits.			
		(ii) Check all wiring for earths.			
		(iii) Physically check wiring, connections and supports are secure.			
3.3	Storage containers	Check the date of test or manufacture on storage containerdate		
3.4	Compressed gas containers	Determine that the compressed gas container is the correct size and type, in good condition, fully charged, and subjected to maintenance in accordance with AS 2030.1.gkPa		
3.5	Detection system	(a) Pneumatic detection system (if fitted):			
		(i) Test pneumatic circuits for leaks.			
		(ii) Check hoses, tube, fittings and supports are secure.			
		(b) Electric detection system (if fitted):			
		(i) Function test all detectors.			
		(ii) Check all wiring for earths.			
		(iii) Check wiring, connections and supports are secure.			
3.6	System interface and shutdown	Test all fire-activated equipment shutdowns (fuel shut-off, ventilation shut down and associated alarms).			

Table 9.4 (continued)

Item No.	Item	Action required and pass/fail requirements	Result	Pass/fail	Comments
3.7	Extinguishing agent	(a) Foam pre-mix solution—replace			
		(b) Wet chemical—replace (see Note 1).			
		(c) Dry chemical powder— replace (see Note 2).			
3.8	Nozzle obstructions	Check for adequate clear space at nozzles and for obstructions likely to impede discharge.			
3.9	Nozzle orientation	Check nozzles are pointing at the predetermined aiming points.			
3.10	Nozzle location and coverage	(a) Check for the introduction of fixtures and bulkheads shielding nozzle discharge and the presence of unprotected hazards.			
		(b) Check that the types of nozzles and caps are appropriate for each appliance.			
3.11	Detector coverage	Check for the presence of unprotected hazards.			
3.12	Operational conditions	Check that the hazard configuration and operational conditions do not adversely affect the system performance.			

NOTE 1 Wet chemical agent to be replaced at the time of the hydrostatic pressure test, or otherwise as specified by the manufacturer.

NOTE 2 Dry chemical powder to be replaced yearly or as advised by the manufacturer.

Table 9.5 — Five yearly routine service schedule

Item No.	Item	Action required and pass/fail requirement	Results	Pass/fail	Comments
4.1	Yearly service	Complete all yearly routine service activities detailed in Table 9.4			
4.2	Container	Subject the container to a hydrostatic pressure test in accordance with the procedure detailed in AS 2030.1 (see Notes 1 and 2).			
4.3	Container valves	Service and lubricate in accordance with the manufacturer's recommendations during hydrostatic pressure test cycle. Replace container valve seats and seals at this time.			
4.4	Container	Refill the container with correct quantity of listed extinguishing agent.			

NOTE 1 This period may be extended to 10-yearly for containers that hold non-aqueous extinguishing agent, where manufacturer's instructions do not recommend a more regular frequency.

NOTE 2 Containers that have been subjected to abusive or abnormal conditions may require hydrostatic pressure testing at greater frequencies.

Appendix A (normative)

Wet chemical systems

A.1 General

Wet chemical extinguishing agents are generally potassium carbonate based, potassium acetate based, potassium citrate based or a combination thereof, mixed with water to form an alkaline solution capable of being discharged through piping or tubing when under expellant gas pressure.

The effect of wet chemical extinguishing agents on fires involving common cooking oils and fats is to combine with these materials to form a vapour-suppression layer that floats on the burning liquids surface. This excludes oxygen from the fuel source and eliminates the release of flammable vapours from the fuel surface.

CAUTION — WET CHEMICAL, WHEN DISCHARGED, IS IN THE FORM OF A FINE SPRAY. SOME OF THE AGENT CAN SETTLE ON SURROUNDING SURFACES AND CAN HAVE A CORROSIVE EFFECT ON ELECTRICAL COMPONENTS AND COOKING EQUIPMENT. PROMPT CLEAN-UP WILL MINIMIZE STAINING OR CORROSION.

A.2 Design

The wet chemicals produced by various manufacturers are usually not identical in all characteristics, and each manufacturer designs equipment for use with a specific wet chemical. Therefore, system design principles applicable to the products of one manufacturer are not applicable to the products of another manufacturer. As a result, it is not practical to include system design details as part of this Standard. However; such system design details are an integral part of the listing of the systems and are included in the manufacturer's listed manual.

The following shall apply for the design of wet chemical systems:

- (a) Wet chemical systems shall be designed on the basis of the flow and extinguishing characteristics of the specific wet chemical used.
- (b) The system shall be listed.
- (c) The quantity of wet chemical required for each system and the rate and duration of discharge shall be determined in accordance with manufacturer's manual.
- (d) Different types of wet chemicals shall not be mixed. The specified wet chemical may be changed where recommended by the system manufacturer, proved by test, and approved by the relevant authority.

A.3 System flushing

After discharge, systems shall be flushed in accordance with the manufacturer's instructions.

A.4 Health and safety

A.4.1 General

In general, wet chemical solutions are relatively harmless and normally have no lasting significant effects on the skin, respiratory system, or clothing. They can produce mild, temporary irritation, but the symptoms usually will disappear when contact is eliminated. However it is known that potassium carbonate is moderately irritating to the skin and eyes and repeated skin contact can lead to dermatitis, but this is based on concentrations higher than those used in wet chemical extinguishing system units.

Irritation of the eyes should be treated by flushing with tap water for 15 min or longer. Any condition of prolonged irritation should be referred to a physician for treatment.

Clean-up of wet chemical is best handled by flushing with water.

Wet chemical systems should not splash burning grease when installed in accordance with the manufacturer's listed manual.

WARNING — THE DISCHARGE OF WET CHEMICAL ONTO ENERGIZED ELECTRICAL APPLIANCES MAY RESULT IN ELECTRIC SHOCK IF BODY CONTACT IS MADE.

A.4.2 Precautions

In systems where wet chemical extinguishing agent is likely to discharge upon personnel, the following shall be provided:

- (a) Warning signs, displayed in a prominent location and containing the information shown in [Figure A.1](#).
- (b) Special personnel training regarding what action to take should a system discharge upon persons.

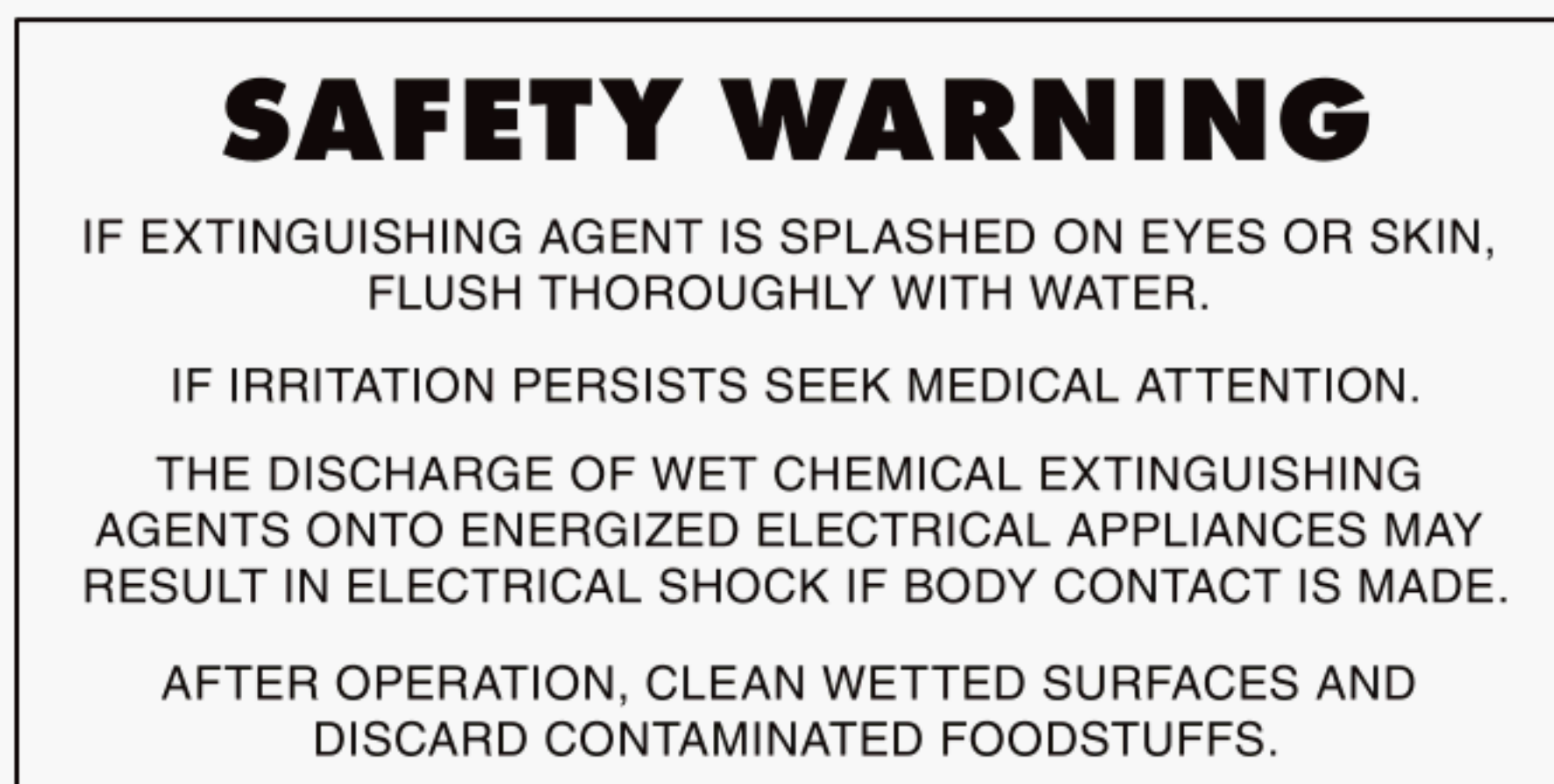


Figure A.1 — Warning sign for wet chemical systems

Appendix B (informative)

Competencies and authority to work

B.1 Introduction

The competencies underpinning satisfactory performance of the inspections identified in the body of this Standard vary with the complexity of the activity and the circumstances of any specific job. Persons and organizations engaged in the inspection of fire protection systems are advised that systems exist to ensure their competence.

B.2 Personal competencies

The Australian system of vocational education and training (VET) establishes nationally recognized qualifications. These qualifications may be awarded following the completion of defined elements in a “Training Package” that requires achievement of a combination of “Units of Competency”. All endorsed Units of Competency and Training Packages are available on the National Register of Vocational Education and Training (VET) (www.training.gov.au). Qualifications that address the competencies of people engaged in the maintenance of fire protection related systems are developed by the Property Services Industry Reference Committee (IRC). Information on the Property Services IRC is available from the Australian Industry and Skills Committee website (www.aisc.net.au/content/property-services-industry-reference-committee).

At the time of publication of this Standard there were two relevant qualifications offered. These are Certificates II in Fire Protection Inspection and Testing (CPP20511) and Certificate III in Fire Protection Inspection and Testing (CPP30811).

Issuance of valid qualifications under the Australian Qualifications Framework (AQF) is reserved to Registered Training Organisations (RTO) and a number of bodies are registered for the provision of these qualifications and/or units of competency. A current listing of organizations registered to deliver both qualifications and specific units of competency can be confirmed by visiting the website of the National Register of Vocational Training (VET) at the website www.training.gov.au.

Provision exists within the AQF for the Recognition of Prior Learning (RPL)/Recognition of Current Competency (RCC) and interested parties should speak with their RTO about using this pathway to recognition.

B.3 Competence of organizations

Organizations involved in the inspection of fire protection systems are able to seek accreditation for this activity. Accreditation is formal recognition of the competence of an organization to perform specified tasks, and considers personnel competence, management systems and report content. Accreditation is possible against AS/NZS ISO/IEC 17020, *General criteria for the operation of various types of bodies performing inspection*.

B.4 Regulatory requirements

The inspection of fire protection systems may be regulated by a number of local authorities, including local councils, State Government and Commonwealth Government bodies. In addition, owners, clients, industry codes of practice, enterprise operating procedures and product technical manuals may include additional specific actions. Persons and organizations engaged in the inspection of fire protection

systems should be aware of local regulation and additional specific actions, and modify their inspection practices accordingly.

Appendix C (informative)

Sample commissioning checklist

COMMISSIONING CHECKLIST			
Item	Task	Reference from listed manual or Clause number from AS 3772:2020	Compliance (Mark: Yes, No, or Not applicable)
1	System configuration		
2	Signs and warning labels		
3	Containers: (a) Location (b) Number (c) Size (d) Marking (e) Charge quantity (f) Fill weight (g) Orientation (h) Mounting		
4	Release mechanisms: (a) Location (b) Connections (c) Pneumatic leak test of actuation pressure lines (where fitted)		
5	Manifolds and valves—Location and number: (a) Joints and fastenings (b) Flexible connections (c) Discharge indicators (d) Pressure switches (e) Check valves (f) Pressure-relief devices (g) Vent valves (h) Charging valves		
6	Distribution systems (a) (i) Layout (ii) Size and fitting orientation (iii) Joints, nozzles and supports (b) Leak test (c) Free passage test		
7	Nozzles (a) Identification		

	(b) Orientation		
8	Electrical system		
9	Functional tests (a) Local alarm (b) Power or fuel shut-off		
10	Actuation system test (a) Audible alarms (b) Audible and visual alarms time delay		

Additional remarks:

Signature of installer

Position

Date

Accreditation No.

Appendix D (informative)

Sample certificate of completion

PART 1: TO BE COMPLETED BEFORE TESTING

We (name of installer)
 of (address)
 hereby certify that we have completed on (date)
 a (name of system) fire-extinguishing installation/
 extension(s) designed by
 in accordance with design documentation
 and installed in accordance with AS 3772:2020.
 Name of client
 Address and location of protected area
 Type of system

Hazard location	Actuation method (automatic/manual)	Agent quantity	No. of containers	No. of nozzles	Applicable drawing(s)

Functional parameters (tick)

Functional interfaces with equipment	<input type="checkbox"/>	Power shut-off	<input type="checkbox"/>	
Air-handling shutdown	<input type="checkbox"/>	Fuel shut-off	<input type="checkbox"/>	
	<input type="checkbox"/>		<input type="checkbox"/>	
	<input type="checkbox"/>		<input type="checkbox"/>	

Date of remote monitoring connection

Variations from this Standard previously agreed to by the relevant authority are attached (Clause references and related variations should be listed).

Detection system details:

Detection area	Detection type	No. of points	Circuit material

Actuation system details:

Actuator location	Actuator type	Manual/Auto	Circuit material

Suppression system details:

Protected area	Suppression type	No. of nozzles	Delivery material

PART 2: TO BE COMPLETED AFTER TESTING

Commissioning test(s) conducted by

Date

Commissioning test(s) witnessed by

Date

Remarks

Appendix E

(informative)

Sample annual system condition report

I (Name)
of (Company)
of (Address)

hereby certify that the fire suppression system fitted to the equipment described below has had its annual maintenance completed in accordance with AS 3772:2020

Name of client:

Address and location of protected area:

Type of system:

Additional remark:

Signature of installer:

Position:

Date:

Accreditation No.:

Bibliography

AS 2118.1, *Automatic fire sprinkler systems, Part 1: General systems*

AS 6183, *Fire protection equipment — Carbon dioxide extinguishing systems for use on premises — Design and installation (ISO 6183:2009, MOD)*

AS/NZS ISO/IEC 17020, *Conformity assessment — Requirements for the operation of various types of bodies performing inspection*

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