

1.1 **SCOPE** - This Standard sets out requirements for the design, installation commissioning and maintenance of pre-engineered fire 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.

1.2 **REFERENCES** - The following referenced documents are indispensable for the application of this Standard.

1318	Use of colour for the marking of physical hazards and the identification
1319	Safety signs for the occupational environment
1851	Maintenance of fire protection systems and equipment
2030	The verification, filling, inspection, testing and maintenance of cylinders
2030.1	Part 1: Cylinders for compressed gases other than acetylene
2444	Portable fire extinguishers and fire blankets—Selection and location
2470	Steel cylinders for compressed gases - three-piece with longitudinal joint—11 kg to 150 kg
3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
3013	Electrical installations—Classification of the fire and mechanical performance of wiring systems
3504	Fire blankets
3509	LP Gas fuel vessels for automotive use
5601	Gas installations
NFPA 17	Standard for Dry Chemical Extinguishing Systems
NFPA 17A	Standard for Wet Chemical Extinguishing Systems
UL 300	Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment

1.3.1 **Authority having jurisdiction** is a government department, or regulation, or the owner.

1.3.2 **Competent person** - A person who has training, qualifications or experience, or a combination of these, the knowledge and skills enabling that person to perform the task required.

2.1 **Emergency Procedures** shall be in place to manage the safety of personnel in the event of fire. Personnel shall be trained in emergency procedures.

2.2.1 Appliances fitted with a fire system shall be fitted with a **warning notice** advising that a fire system is fitted and may operate automatically and shut-off power or fuel to the appliances. They shall be of durable, corrosion-resistant construction; permanently attached; and positioned so they are clearly visible.

2.2.2 **Manual release** instruction notices shall be provided at each manual release point. Instruction notices shall use white lettering on a red background.

2.3.1 **Fire extinguishers** shall be selected and installed as required by AS 2444. The installation of fixed fire suppression systems shall not be deemed to eliminate the need for fire extinguisher(s). All portable fire extinguishers shall be maintained in accordance with AS 1851.

2.3.2 **Operator training** shall be done in the use of the fire equipment.

2.4 **Fire Blankets** - Kitchens and cooking areas shall be equipped with a fire blanket complying with AS 3504.

3.2 The **system documentation** shall include the following: Name and address of owner/client; Name and address of installer; Name of designer; Design documentation reference; Name, address and location of protected area; System and listing identification.

3.3 **Documentation** shall include:

- Type of fire system installed.
- Indication of the functional parameters, including: interfaces with equipment; air-handling shutdown; power shut-off; and fuel shut-off.



- (c) Date of remote-monitoring connection.
 - (d) Suppression system details, including: protected location; brand and specification of agent; quantity of agent; method of agent quantity calculation; pressure; number, capacity and location of agent cylinders; type and size of container valve; number of nozzles; details of the nozzles by type, size and orifice; specific items of equipment protected by each nozzle; and specification of hose, tube, pipe and fittings.
 - (e) General arrangement drawings showing the layout of the system and detailing the location of components.
 - (f) The area of coverage provided by the fire system design including —
 - (i) system configuration of the automatic and manual release;
 - (ii) the functional sequence of events;
 - (iii) fire system interface with the equipment; and
 - (iv) shutdowns and time delays.
 - (g) Detection and control, including: type of detection; specific area protected and location of detectors; actuator location; actuator type; and single line diagram showing detection, control, and alarm circuits and shutdown interfaces.
- 3.4 **Schematics shall be provided** and contain sufficient detail to enable evaluation of the protection of the cooking area. Plans 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 cylinders.
 - (d) Operating devices.
 - (e) Auxiliary equipment.
 - (f) Electrical circuitry.
- 3.6 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: all components and part numbers; technical data sheets; Materials Safety Data Sheets; and the maintenance procedures.
- 4.1 **Pre-engineered fire systems for cooking equipment shall—**
- (a) provide fire for the exhaust hood, ductwork and cooking appliances;
 - (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 manufacturer's manual; and
 - (d) include automatic activation as an integral part of their listing.
- 4.3 **Moveable Cooking Appliances** - shall be provided with a fire system that covers the envelope 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.
- 4.5 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.
- 4.6.1 **Fuel Shut Off shall apply:**
- (a) Upon activation of the fire system, all sources of fuel and electric power that produce heat to appliances requiring 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.
 - (c) Shut-off devices shall require manual resetting.
- Steam supplied from an external source is not required to automatically shut-off.
- 4.6.2 **Gas shut-off controls** - In systems where automatic gas shut-off occurs, suitable measures shall be provided to prevent the release of unignited gas upon restoration of supply. Gas shut-off valves shall be approved.
- 4.7.1 **Simultaneous operation** - Where two or more hazards can be simultaneously involved in fire by reason of their

WARNING
THIS COOKING APPLIANCE IS
PROTECTED BY A FIXED
FIRE PROTECTION SYSTEM
RELOCATION OF THE APPLIANCE
BEYOND THE PROTECTED AREA WILL
COMPROMISE FIRE PROTECTION

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.

4.7.2 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) a central station, proprietary, or remote station alarm service;
 - (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.

5.2.2 Location and arrangement of cylinders and accessories shall and arranged to facilitate inspection, testing, recharging and maintenance, and to ensure minimal interruption to fire protection during these operations. Where cylinders are located in a concealed space, suitable access points shall be provided and identified. Cylinders shall be located in accordance with the following:

- (a) Cylinders shall be located within the temperature range specified in the manufacturer's listed manual.
- (b) For temperatures outside the temperature range are expected, protection shall be provided to maintain the temperature within the listed range.
- (c) Cylinders shall not be located where they could be subjected to mechanical, chemical, or other damage.
- (d) If damage is expected, protective enclosures or guards shall be provided.
- (e) Cylinders shall be located near the hazard(s) protected but not where they will be exposed to the fire.

6.2.1 Pipework shall be installed in accordance with this Standard, the manufacturer's manual, and the following:

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

6.2.3 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).

6.3.1 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 of nozzles shall be so aimed as to ensure that they do not cause the splashing of hot or burning oil during discharge. 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 effectively protect the following hazard areas:

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

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

6.3.6 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.

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

7.3 Detectors shall be installed as follows:

- (a) A detector shall be provided above each protected cooking appliance or as per manufacturer's manual.
- (b) At least one detector shall be installed within each exhaust duct opening, in accordance with the manufacturer's manual. 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, provision shall be made for access to permit their identification and maintenance.

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

- (a) At least one manual actuator shall be provided for each system.
- (b) manual activator(s) 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 an approved electrical power supply is provided, manual actuation shall be by mechanical means.

7.4.3 **Manual actuators** shall:

- (c) be provided with an operating instruction notice that identifies the protected hazards, with lettering at least 7 mm in height. These instructions may also include pictographs.

EXTINGUISHING SYSTEM
MANUAL RELEASE FOR
Identify Hazard
Insert Manual Release Instructions

7.5.1 **Control equipment** shall comply with:

- (a) 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 cylinders.
- (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. Initiate alarms, and cause the shut-off of any associated devices such as extraction/exhaust fans as may be required by this Standard.
- (c) The extinguishing system shall be connected to the fire alarm system, if provided, so that the actuation of the extinguishing system will sound the fire alarm.

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.

7.5.2 Where **electrical power** is used to operate the automatic fire extinguishing system, it shall be supervised and provided with a stand-by power supply. System monitoring shall give distinctive audible and visual indication when faults occur in any of the following: Automatic detection system, Electrical actuation circuit, Electrical power supply.

8.3 **System Function and Operation Test** shall include and be confirmed by a report.

- (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.

9.2 **Maintenance of fire systems** shall be performed by competent persons. Competent persons should be accredited to the level required for the service being conducted.

9.3.1 **Records shall be retained** by the owner and include details of maintenance activities; defects; rectifications and by whom; and date conducted.

9.4.3 Any **defects** that could impair the operation of the fire system shall be reported to the owner and operator prior to the service person leaving the site. Any defects that are fundamental to the design of the fire system shall be

reported to the fire system manufacturer. Unless alternative risk-reduction measures are implemented for the safety of personnel, equipment shall not be operated until the defects are rectified.

- 9.6 **Condition Report shall be completed on an annual basis** and shall be submitted to the equipment owner within one month of the scheduled annual maintenance being performed. The system condition report shall contain the results of all procedures specified in Tables 9.1, 9.2, 9.3 and 9.4.
- 9.7.1 **Inspection of fire systems** shall be carried out in accordance with Table 9.1.
- 9.7.2 **Testing of fire systems** shall be done in accordance with Table 9.2 and the manufacturer's recommended method.
- 9.7.3 **Preventive maintenance** of fire systems shall be done in accordance with Table 9.3 and the manufacturer's procedure. In certain environments more frequent cleaning may be required. Cylinders that have been subjected to abusive or abnormal conditions may require hydrostatic pressure testing at greater frequencies.
- A1 **Wet chemical extinguishing agents** are generally potassium carbonate based mixed with water to form an alkaline solution discharged through piping when under expellant 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.
- A3 **After discharge**, systems shall be flushed in accordance with the manufacturer's instructions.
- A4.2 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.
 - (b) Special personnel training.
- B4 The inspection of fire systems may be regulated by a number of authorities, included: 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 systems should be aware of local regulation and additional specific actions, and modify their inspection practices accordingly.

SAFETY WARNING

IF EXTINGUISHING AGENT IS SPLASHED ON EYES OR SKIN, FLUSH THOROUGHLY WITH WATER.
IF IRRITATION PERSISTS SEEK MEDICAL ATTENTION.

THE DISCHARGE OF WET CHEMICAL EXTINGUISHING AGENTS ONTO ENERGIZED ELECTRICAL APPLIANCES MAY RESULT IN
ELECTRICAL SHOCK IF BODY CONTACT IS MADE.

AFTER OPERATION, CLEAN WETTED SURFACES AND DISCARD CONTAMINATED FOODSTUFFS.

- APPENDIX C SAMPLE COMMISSIONING CHECKLIST
- APPENDIX D SAMPLE CERTIFICATE OF COMPLETION
- APPENDIX E SAMPLE ANNUAL SYSTEM CONDITION REPORT