

National Fire Authority		<i>Guideline No: GL-01</i>
GUIDELINE		<i>Prepared By:</i> Structural Fire Safety Department
SELECTION, INSTALLATION & MAINTENANCE OF PORTABLE FIRE EXTINGUISHERS AND FIRE BLANKETS.		<i>Authorised By:</i> Chief Fire Officer
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1. PURPOSE

This guideline has been developed to ensure that consistent advice is provided regarding all aspects pertaining to portable fire extinguishers and fire blankets by the building industry and National Fire Authority (NFA).

2. SCOPE

This guideline outlines statutory and NFA requirements regarding the selection, installation, rating, classification, maintenance requirements, use, and replacement of, portable fire extinguishers and fire blankets in all classes of buildings.

3. USE OF FIRE EXTINGUISHERS

Portable Fire Extinguishers are required by the Fiji National Building Code (NBC) and NFA requirements to enable building occupants to extinguish small fires. Without Portable Fire Extinguishers the number and size of fires in Fiji would be far greater and cause significantly more destruction than is currently experienced.

Portable Fire Extinguishers need to be located, installed and maintained to ensure that building occupants can easily access and use them effectively.

4. USE OF FIRE BLANKETS

Fire blankets can be provided within all building types predominantly within kitchen areas. They can be used by building occupants to smother fires that may originate within kitchens and other areas of the building where cooking may be undertaken. Although fire blankets are not required by the NBC, the NFA strongly encourage building designers and developers to install a fire blanket within all kitchens.

5. SELECTION & INSTALLATION CRITERIA

5.1 *Portable fire Extinguishers*

Portable Fire Extinguishers are required by law to be installed within every building except:

- Class 1 residential dwellings
- Class 2 or 3 buildings

Portable Fire Extinguishers are an excellent means of providing effective, initial attack on a fire by occupants. The NFA strongly recommends that Portable Fire Extinguishers be installed for all classes of building, including Class 2 and 3 buildings. This guideline has been developed with the objective of providing all buildings with fire extinguishers.

The selection of suitable extinguishers depends on a number of factors, including, but not limited to, the following:

- expected types of fires including size and propagation
- construction and occupancy of the property
- special risk to be protected
- extremes of temperature expected
- size and degree of hazards which would affect their use
- reliability and availability of other manual or automatic firefighting equipment
- knowledge and capability of the likely user.

Portable fire extinguishers satisfy the above if:

- they are provided and installed in accordance with AS 2444-2001 "Portable fire extinguishers and fire blankets – Selection and location" and this guideline, except water type extinguishers which need not be installed in a building or part of a building served by a hose reel, and;
- extinguishers provided for fires other than Class A fires, are suitably located adjacent to the relevant risk, and;
- where water type extinguishers are provided, they are located, wherever practicable, adjacent to required exits.

The distribution of portable fire extinguishers shall be in accordance with the hazard classification of the area, or risk to be protected.

Portable fire extinguishers shall be located in a conspicuous and readily accessible position, adjacent to the risk, in the path of exit travel or near exits, and mounted at the appropriate height. Portable fire extinguishers should not be located in areas where they are not seen by the building occupants when traveling towards an exit.

Appendix A of this guideline outlines the type and location of portable fire extinguishers for identified risks. For additional information, reference should be made to Section 4 (Distribution of Portable Fire Extinguishers in buildings) of Australian Standard AS 2444-2001. Where flammable or combustible liquids are stored, it is recommended that you seek advice from the Chief Fire Officer of the NFA.

5.2 Fire Blankets

It is recommended for fire blankets to be located within all buildings that have a kitchen. Examples of these buildings include restaurants, apartments, old people's homes and hospitals. The fire blanket should be located adjacent to the exit from the kitchen and preferably next to the fire extinguisher.

Fire blankets are manufactured in accordance with AS/NZS 3504, are rectangular or square in shape and are available in sizes between 0.9 m × 0.9 m and 1.8 m × 1.8 m. Once a fire blanket has been used on a fire it must be disposed off and replaced immediately.

6. RATING AND CLASSIFICATION

Fire extinguishers complying with Australian Standards are marked with a classification and rating, determined in accordance with AS 1850.

Extinguishers are rated by their performance and suitability for a particular class of fire, i.e. A water extinguisher will be marked 2A and a dry chemical extinguisher will be marked 2A:40B:E. The classes of fire are:

- Class A:** Fires in ordinary combustible materials, such as wood, cloth, paper, rubber and many plastics.
- Class B:** Fires in flammable and combustible liquids, greases, and oils.
- Class C:** Fires in combustible gases.
- Class D:** Fires in combustible metals.
- Class E:** Fires which involve energised electrical equipment.
- Class F:** Fires for cooking oils and fats.

The number before the letter is a measure of the relative performance within that class range, namely:

- between 0 and 10 for Class A
- 20 and 80 for Class B
- 1 and 4 for Class F.

A greater rating reflects an increased effectiveness of the extinguisher for the nominated class of fire. When a fire extinguisher is rated for more than one class of fire, it is expressed in alphabetical order, i.e. 2A:40B:E. In most cases the higher the rating the larger the size of the fire extinguisher.

There is no one type of fire extinguisher that will universally cover all fires. For this reason, careful consideration needs to be given to the selection of the most suitable fire extinguisher, or combination of fire extinguishers.

The rating and classes listed in the attached appendix are minimum recommendations only. Individual companies may not manufacture exact ratings as listed, therefore, the next highest rating should be utilised. For example, in the instance of a 1A:5B: (E) Dry Powder not being available then 1A:10B: (E) Dry Powder would be considered appropriate.

Note: If the attached Guideline table (Appendix A) is followed, the intent of Section 2 of the AS 2444-2001 has been satisfied.

7. MAINTENANCE

The relevant maintenance standard for portable fire extinguishers is found in: AS 1851.1-2005 "Maintenance of fire protection equipment - Portable fire extinguishers and fire blankets". The current maintenance schedule defined by this standard is summarised below.

Classification	Inspection Frequency
Level 1	Six-monthly intervals
Level 2	Yearly intervals
Level 3	Three-yearly intervals
Level 4	Six-yearly intervals
Level 5	After use

Immediately following each inspection, the maintenance tags are required to be indented and a written inspection report submitted to the building owner or occupier. The owner or occupier is then responsible for keeping a copy of that maintenance report on site at all times and made available to an NFA Officer upon request.

8. ADDITIONAL FACTORS TO CONSIDER WHEN SELECTING AN EXTINGUISHER

Physical factors to consider are:

- choice of an appropriate extinguishant for the type of fire most likely to occur
- size and mass of the fire extinguisher and the ability of the user to carry and operate it
- effects of environmental conditions on the fire extinguisher and its support fixture
- possibility of adverse reactions, contamination, or other effects of an extinguishant on manufacturing processes or equipment
- possibility of winds or draughts affecting the distribution and thus effectiveness of the extinguishant
- possibility of installation of the fire extinguisher in a location where vibration may affect the components of the extinguisher or its contents, e.g. powder.

Health and safety factors to consider are:

- water-based extinguishants (water, wet chemical, hydro spray, and foam) are electrically conductive and therefore must not be used on fires involving electrically energised equipment
- carbon dioxide, used in sufficient concentration to extinguish a fire, will displace air. In a confined space, the possible resultant oxygen deficiency may be life-threatening
- powder extinguishers discharged in a confined space can temporarily reduce visibility and may cause respiratory irritation, thus should not be used in patient care areas or areas that contain aged or very young persons
- A:B:E powders based on ammonium phosphate should not be used for the protection of appliances using cooking oils or fats.

For further information on the additional factors to consider when selecting a portable fire extinguisher refer to Appendix A of AS2444-2001.

9. SIGNAGE

9.1 *Portable Fire Extinguishers*

All fire extinguishers must be provided with signage in accordance with AS 2444 – 2001. A red sign with the minimum dimensions of 225mm x 150mm must be located above the fire extinguisher at least 2000mm from the ground level.

9.2 *Fire Blankets*

All fire blankets must be provided with signage in accordance with AS 2444 – 2001. The sign shall be a minimum of 2000mm from the ground level and be of sufficient size for the occupants of the building to identify the location of the fire blanket. NFA recommends the sign be a minimum of 225mm x 150mm.

7. CONSIDERATIONS AFTER USE OF EXTINGUISHERS

Health and Safety:

Most fires produce toxic products of combustion and fire involving some materials may produce highly toxic gases. Fires consume available oxygen and may present dangerously high exposure to convectional or radiated heat. Any space in which there is smoke, fumes or pungent odours, or in which extinguishers have been discharged, should be immediately vacated by all persons not involved in fire control. The space should only be re-entered with caution.

Note: *Inappropriate use of extinguishers may result in electrocution, oxygen deficiency, or respiratory irritation.*

8. CONSIDERATIONS REGARDING REPLACEMENT OF EXTINGUISHERS.

- Access to the area (risk) that the extinguisher is to be provided for, i.e. kitchen, open fire, garage, etc;
- Always recommend replacement with an extinguisher of equivalent or higher rating. i.e. 1A:10B: E - replace with a Dry Powder 1A:10B: E Rating or higher;
- Aerosol type extinguishers are not recommended for commercial premises; and
- It is recommended that only an 'F' type or B:E (other than ammonium based) extinguisher be used to protect a deep fat fryer.

9. REFERENCES

- a) Required Performance clause NEP1.1 of the National Building Code (Inter alia deemed to satisfy clause NE 1.7)
- b) Performance Requirement EP1.2 of the Building Code of Australia 2006 (inter-alia deemed-to-satisfy clauses E1.6 and E1.10)
- c) AS 2444 – 2001 *Portable fire extinguishers and fire blankets – Selection and location*
- d) AS 1851.1 – 2005 *Maintenance of fire protection equipment - Portable fire extinguishers and fire blankets*
- e) AS 1850 – 1997 *Portable fire extinguishers – Classification, rating and performance testing*
- f) AS 1940 – 2004 *The Storage and Handling of Flammable and Combustible Liquids*

APPENDIX A - Fire Extinguisher and fire blanket placement and size guide

Risk	Extinguisher Rating & Type	Fire Blanket size and location	Preferred Location
Building where hose reels are NOT provided			
	2A: Water type (1 per 200 m ² or part thereof)		Adjacent to exit.
Dwellings			
Kitchen	1A:5B:E	0.9 x 0.9m	Adjacent to kitchen door
Open heating, etc	1A:5B:E		Near exit
Flats, Motels and Hotels			
Kitchen	1A:5B:E	Minimum 1.2m x 1.2m	Adjacent to kitchen door.
Takeaway Food shops or Kitchens	40B:E Dry Chem. Not A:B:E	Minimum 1.2m x 1.2m	
- with deep fryer	<u>Or</u> 2A:4F Wet Chem.		B/w 2 m and 4 m max.
Electrical switchboards	2A:20B:E Dry Chem.		B/w 2 m and 20 m from electrical switchboard.
Electrical switchrooms	2A:40B:E Dry Chem.		Adjacent to and external to entry door.
Plant rooms-			
- Oil fired air cond. (Hose reels installed)	80B:E Dry Chem.		Adjacent to and external to entry door b/w 2 m and 5 m max.
- (No hose reels)	4A:80B:E		
- Gas fired air cond.	2A:40B:E Dry Chem.		
- Lift motor	2A:40B:E Dry Chem. <u>Or</u> 10B:E Carbon Dioxide		Adjacent to exit door, 4 m max.
Commercial and Office Buildings			
Takeaway Food shops or Kitchens	40B:E Dry Chem. Not A:B:E	Minimum 1.2m x 1.2m	Adjacent to exit door and accessible from cooking area, b/w 2 m and 20 m max.
- without deep fryer	<u>Or</u> 2A:4F Wet Chem.		
Electrical switchboards	2A:20B:E Dry Chem.		B/w 2 m and 20 m from electrical switchboard.
Electrical switchrooms	2A:40B:E Dry Chem.		Adjacent to and external to entry door b/w 2 m and 5 m max.
Plant rooms-			
- Oil fired air cond. (Hose reels installed)	80B:E Dry Chem.		Adjacent to and external to entry door b/w 2 m and 5 m max.
- (No hose reels)	4A:80B:E		
- Gas fired air cond.	2A:40B:E Dry Chem.		
- Lift motor	2A:40B:E Dry Chem. <u>Or</u> 10B:E Carbon Dioxide		Adjacent to exit door, 4 m max.

Risk	Extinguisher Rating & Type	Fire Blanket size and location	Preferred Location
Industrial Buildings			
Electrical switchboards	2A:40B:E Dry Chem. Or 10B:E Carbon Dioxide		
- Factory area less than 600 m ²	2A:20B:E Dry Chem.		Between 2 m and 20 m from electrical switchboard.
Electrical switchrooms	2A:40B:E Dry Chem.		Adjacent to and external to entry door, b/w 2 m and 5 m max.
Vehicle Entry Points, Loading Bays	4A:80B:E Dry Chem.		
- Hose reels	4A:80B:E		b/w 2 m and 10 m max
- No hose reels	4A:80B:E		Adjacent to exit door b/w 2 m and 20 m
Workshops and Garages			
- hose reels installed	2A:60B:E 80B:E Dry Chem.		Adjacent to exit door.
- no hose reels	2A:40B:E Dry Chem. 2A:40B Foam4A:80B:E		
Automotive Practices	2A:40B:E Dry Chem. 2A:20B Foam		Between 2 m and 20 m from practices.
Flammable Liquid Store	Refer Table 11.3 of AS 1940		
Flammable Liquid Cabinets ¹ 250 Litre	2A:60B:E Dry Chem. For each cabinet		Between 3 m and 10m from cabinet.
750 Litres	Additional 2A:20B Foam Ext or foam fire hose reel		
Spray Booth	2A:60B:E Dry Chem.		Between 2 m and 5 m from booth.
Automotive Practices	2A:40B:E Dry Chem. 2A:20:B Foam		Between 2 m and 20 m from practices.
Computer Room	1A:20B:E or 2A:20B:E Dry Chem.		Adjacent to exit door.
Electrical Practices	2A:20B:E (Powder)		Between 2 m and 20 m from practices.

¹. Where flammable or combustible liquids are stored, the selection and installation of portable fire extinguishers must be in accordance with AS1940-2004 "The storage and handling of flammable and combustible liquids".

Hospitals, Health Care and Nursing Homes			
Patient Care Areas	5B:E Carbon Dioxide		Adjacent to nurse's station, b/w 2 m and 20 m max.
Operating Theatre	5B:E Carbon dioxide		Adjacent to exit door.
Surgery	5B:E Carbon dioxide		Adjacent to exit door, b/w 2 m and 20 m max.
Kitchens	40B:E Dry Chem. Not A:B:E	Minimum 1.2m x 1.2m	Adjacent to exit door and accessible to cooking areas, b/w 2 m and 20 m max.
Laboratories	5B:E Carbon dioxide		Adjacent to exit door, b/w 2 m and 20 m max.
Switchboards	5B:E Carbon dioxide		Adjacent to and between 2 m and 20 m from electrical switchboard.
Electrical switchrooms	5B:E Carbon dioxide		Adjacent to and external to entry door, b/w 2 m and 5 m max.
Plant rooms	80B:E Dry Chem. for gas fired.		Adjacent to and external to entry door.
- Hose reels installed	4A:80B:E Dry Chem.		
- No hose reels	2A:40B:E Dry Chem.		Adjacent to exit door 4 m max.
- Lift motor	Or 10B:E Carbon Dioxide		
Schools			
Administration area	1A 20B:E Dry Chem.		Adjacent to exit door and accessible for use on electrical office equipment.
Portable classrooms - stand alone	2A Water type or 2A:40B:E Dry Chem.		Adjacent to exit, b/w 2 m and 20 m.
Portable classroom with switchboard	20B:E Dry Chem.		Between 2 m and 20 m from electrical switchboard.
Electrical switchrooms	2A:40B:E Dry Chem..		Adjacent to and external to entry door, b/w 2 m and 5 m max.
Electrical switchboard	1A:20B:E Dry Chem.		Adjacent to and between 2 m and 20 m from electrical switchboard.
Canteen or kitchen	40B:E Dry Chem. Not A:B:E Or 2A:4F Wet Chem.	Minimum 1.2m x 1.2m	Adjacent to exit doors and accessible to cooking areas.
Audio/Visual	20B:E Dry Chem.		Adjacent to exit doors.
Science room or laboratories fume cupboard	2A:40B:E Dry Chem. 5:BE CO ²		Adjacent to exit door, between 2 m and 2m max.

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Home Economics	40B:E Dry Chem. Not A:B:E	Minimum 1.2m x 1.2m	Adjacent to exit door.
Boiler rooms	2A:40B:E Dry Chem.		External to and adjacent to entry doors.
Woodwork room	2A:40B:E Dry Chem.		Adjacent to exit door.
Woodwork machine room	1A:20B:E Dry Chem.		Adjacent to exit door.
Art room			
- 3D (spray booth)	2A:40B:E Dry Chem.		Accessible to spray booth.
- Kiln room	1A:20B:E Dry Chem.		Accessible to kiln.
Metal work	2A:40B:E Dry Chem.		Adjacent to exit door.
Automotive practices	2A:40B:E Dry Chem.		Adjacent to exit door.
Computer room	1A:20B:E Dry Chem.		Adjacent to exit doors.
Electrical practices	1A:20B:E Dry Chem.		Adjacent to exit door.
Staff resources area	1A:20B:E Dry Chem.		Adjacent to exit door.
Bio Box	2A:40B:E Dry Chem. Or 10B:E Carbon Dioxide		Adjacent to exit door. Within 4 m max.

Temporary Structures

General	2A Water Type (1 per 200m ² or part thereof)		Adjacent to exit.
Electrical Generator	4A:80B:E		Between 1 m and 4 m from generator.
Electrical Switchboard	4A:80B:E		Between 2 m and 4 m from electrical switchboard.
Flammable Liquid or Gas Containers	4A:80B:E		Between 2 m and 4 m from flammable liquid or gas containers.
Cooking Areas - Single cooking facility	2A:40B:E 40B:E Dry Chem.	Minimum 1.2m x 1.2m	Between 2 m and 4 m from cooking area. Between 2 m and 4 m from cooking area.
- Multiple cooking facilities	Not A:B:E Or 2A:4F Wet Chem.		

Note 1: Dry Powder extinguisher may be substituted for the use of a water type extinguisher where they have a Class A rating.

Note 2: Where cooking appliances (using cooking oils and fats) are installed, a fire blanket is recommended, additional to the above

Note 3: Water type extinguishers not to be located near other specific risks (e.g. electrical).

Amusement Rides and Devices

Registered capacity of amusement device (number of patrons)		Number of fire extinguishers				
		Category of amusement devices (see Legend)				
Over	Up to and including	A	B	C	D	E
0	5	1	1	1	1	1
5	20	2	2	1	1	1
20	50	3	2	2	2	1
50	-	3	3	3	2	1

LEGEND:

Category A made of and housed in a structure of primarily combustible or low melting temperature materials, such as timber, aluminium, plastics.

Category B made of primarily combustible or low melting temperature materials and sited in open air.

Category C made of and housed in a structure where no significant quantities of combustible or low melting temperature materials are used or contained.

Category D containing no significant quantities of combustible or low melting temperature materials.

Category E made in a manner that presents minimal fire danger or hazard.

Fire extinguishers shall be provided in accordance with the following requirements:

- a) The number of extinguishers shall not be less than as specified in the table above.
- b) The capacity of any fire extinguisher shall not be less than 2A:40:BE powder type.
- c) At least one of the specified extinguishers shall be located at either the operator's position or the electrical control.
- d) Extinguishers shall be supported by a substantial bracket.
- e) Extinguishers shall be maintained in accordance with AS 1851.

Pyrotechnics

The operator of the outdoor display shall provide at least (1) 2A water type fire extinguisher, (1) 2A:40B:E Dry Chemical fire extinguisher, (1) 20 L container of water and (1) bucket of sand at each point of launch.

Note 1: Local council and the fire brigade are required to be informed of the time, location and type of display to be undertaken.

Note 2: The pyrotechnician should be licensed and the license must be available on request.

Vehicles		
Sedan, station wagon, panel van or utility	1A:5B:E	Adjacent to driver's seat
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Caravan/Campervan		
- Single compartment	1A:5B:E	Adjacent to exit door ¹
- Multi compartment	1A:5B:E	Adjacent to exit in each compartment ³
- Relocatable dwelling	1A:5B:E	Adjacent to kitchen and near exit.
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Outboard/Inboard Powered Boat		
- Small fuel tank <25 L	5B:E 20B:E	Adjacent to drivers seat ³ Adjacent to drivers seat ³
- Large fuel tank >25 L	2A:10B:E	Min of 2 fire extinguishers located adjacent to driver's seat.
- Houseboat and motor cruising yacht		
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Passenger carrying vehicle		
- Not fitted with integral luggage compartment	2A:20B:E (fitted with hose)	Adjacent to driver's seat
- Fitted with integral luggage compartment	2A:20B:E (fitted with hose)	Adjacent to driver's seat plus one mounted near underfloor area or engine
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- Cargo carrying vehicle	Non DG's 1A:10B:E (fitted with hose)	Adjacent to driver's seat ²
	DG's – Reference Chapter 12 Australian Dangerous Goods Code	
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¹ In caravans and boats where cooking appliance (using cooking oils and fats) are installed, a fire blanket is recommended, additional to the above.

² Additional extinguishers appropriate to the cargo carried and in accordance with the relevant regulations.

For further information contact NFA Fire Safety Department on 331 2877 or email: firesafety@nfa.gov.fj