

Fire Extinguishers: A Burning Topic

Contents

1	Introduction	2
2	Legislation	2
3	Types of Fire Equipment	3
4	Consideration of the Type and Placement of Fire Equipment.....	5
5	Fire Equipment Inspections and Maintenance	5
5.1	Items to be inspected on a monthly basis:	6
6	Conclusion.....	7
7	Pictures	8

1 INTRODUCTION

Fires cause major infrastructure damage and take multiple lives each year in both the built and construction environments. Some notable disasters in recent years include, but is not limited to:

- Porterville – October 2018
- Knysna – June 2017
- Denel Munitions Factory Blast - September 2018 (8 persons died)
- Paarl Print Factory - April 2007

These cases cause major disruptions to everyday lives of everyday people and it takes considerable efforts and resources to rehabilitate/rebuild these areas. Fire Equipment in buildings are often overlooked as a critical resource in terms of Health & Safety and compliance. The provision of sufficient, serviced and charged equipment in a building or building site plays a large role in the mitigation of the damage and associated externalities which fires may cause. However, this equipment is only useful if it can be accessed quickly and easily and are appropriate for the type of fire to be extinguished and the environment in which the fire is found.

This article will explore legal requirements for all workplaces in respect to fire equipment and provide general guidelines for the maintenance, care and use of this equipment.

2 LEGISLATION

The Occupational Health & Safety Act 85 of 1993 (OHSA) - regulates the safe usage and mandatory provision of fire equipment at a premise and the testing of or repair thereof.

Specific Regulations which addresses Fire Equipment in the workplace are as follows:

- Construction Regulation 25 and 29
- Environmental Regulation for Workplaces 9
- Pressure Equipment Regulations

Fire Extinguishers' are legislated as per the SANS 0400-1990, SANS 10105-1:2005, SANS 1475-1:2006 and the Occupational Health & Safety Act, (Act 85 of 1993)

- SANS 0400-1990: TT37 provides the amount, size and type of fire extinguishers
- SANS 1475-1:2006 - regulated the production of reconditioned fire-fighting equipment viz provides the intervals at which fire extinguishers must be serviced
- SANS 10105-1:2005 - regulates the use and control of firefighting equipment - Part 1: Portable and wheeled (mobile) fire extinguishers
- SANS 1186-1:2008 – regulates symbolic signs (Part 1: Standard signs and general requirements)
 - If you are conducting any night works at your offices, your symbolic signage should be specified to have a reflective index (“glow in the dark”) which can be identified by the yellowish hue on the symbolic sign.
- Community Fire Safety By-Law 11527



Non-Reflective

Fire Equipment Sign



Reflective

Fire Equipment Sign

3 TYPES OF FIRE EQUIPMENT

Many types of fire extinguishers has been developed over the years dependant on the types of environments in which they are to be used and the types of fires they are purposed to extinguish. The types of fires generated are divided into different classes and are clearly depicted on the cylinder itself. Each type of fire extinguisher is designed to extinguish one or more types of fires and are tabulated below.

Extinguisher Type	Color coding of Labels	Uses	Advantages	Disadvantages
WATER	Red	Class A fires	<p>Causes a minimum of damage as only a small quantity of water used.</p> <p>It is cheap and will extinguish most small fires.</p> <p>Always available</p> <p>Excellent cooling properties</p> <p>Provided protection for fire party</p> <p>Best choice for Class A</p>	<p>Can only be used on a class A fire.</p> <p>Has only a small quantity of water so it only is used on small fires.</p> <p>Not to be used on Electrical Fires</p> <p>Can reduce stability</p> <p>Can spread Class B fires</p> <p>Damages/destroys equipment</p>
FOAM	Cream	Class A and B Fires	<p>Will extinguish class A and B fires with minimal water damage</p> <p>Foam can be sprayed onto a flammable liquid to prevent fire.</p> <p>Forms air-tight blanket over burning liquids</p>	<p>Foam conducts electricity and cannot be used on class C or D fires.</p> <p>Not to be used on Electrical Fires</p> <p>Damages/destroys equipment</p>

Minimum chance of re-flash
 Can be used from distance – around corners, from upper decks.

<p>CO²</p>	<p>Black</p>	<p>Class C in extreme cases class A & B</p>	<p>Rapid in action. Cleanliness causes no damage by its use. Non-Conductor of electricity. Being a gas, it penetrates into inaccessible places. Safe for Class C Non-corrosive, non-damaging to equipment Minimal chance of re-flash in sealed space Effective on small Class A & B fires in open spaces</p>	<p>The total weight of the extinguisher to the quantity of gas discharged is considerable. A 9kg CO² capacity extinguisher can weigh about 30kg. There is no danger to the user if used in a confined space or atmosphere, as it removes oxygen. Touching the discharge horn may cause frostbite Displaces oxygen – can kill fire fighters No re-flash protection in open spaces</p>
<p>DRY POWDER (DCP)</p>	<p>Blue</p>	<p>Classes A, B, C</p>	<p>Can be used on any class of fire. Non – conductor of electricity. Easily rechargeable Knocks down flames Fast and effective 5m range Rated for Class B and C fires</p>	<p>DCP is Messy Can damage sensitive electrical apparatus Minimal protection against re-flash Highly corrosive to electronic equipment Agent can cake and solidify in container</p>

4 CONSIDERATION OF THE TYPE AND PLACEMENT OF FIRE EQUIPMENT

In our experience in the built environment we have found that a 4,5 kg Dry Chemical Powder (DCP) Fire Extinguisher is by far the most ideal and widely used type of fire extinguisher. The reasons for this are as follows:

- DCP's are ideal for the three types of fires which can occur in an office (class A, B and C)
- DCP's are more cost effective and overall cheaper than other types of fire extinguishers considering the classes of fire it can extinguish
- It does not release any toxic fumes
- At a weight of 4,5 kg, DCP's are less cumbersome for employees (especially smaller woman) to handle during an emergency.

There are a few caveats to the above that must be considered which are as follows:

- A general height assessment to be conducted in the office to ensure that shorter employees will be able to reach and access the equipment. In most cases a height of 1.2 meters (waist height) is recommended.
- If your office uses high end computer equipment or critical installations (e.g server rooms) a DCP is not recommended as it will destroy all the components of the device/equipment/installation whilst the fire is being extinguished. In this case a CO² fire extinguisher is recommended.
- All fire equipment to be unobstructed at all times.
- The occupancy rating and attributing SANS 10400 requirement to be verified in all different types of workplace/environments.
- Fire extinguishers should not be installed in areas where high temperatures are likely to occur unless protection for this equipment is provided.
- DCP's must not be installed in corrosive environments unless specified for such an environment.

5 FIRE EQUIPMENT INSPECTIONS AND MAINTENANCE

The National Fire Protection Association (NFPA) sets the standard for fire extinguishers in the regulation NFPA 10 and SANS 1475:

- Fire equipment should be serviced every 12 months, by a reputable registered company, to ensure they are operable.
- Fire extinguishers are subject to 5-year cylinder inspections which are conducted by reputable registered companies.
- A monthly inspection must be conducted by a responsible person (fire team member or the SHE Representative) to ensure all faults are detected and rectified timeously,

This section will briefly explain the inspection and maintenance requirements for fire extinguishers.



Figure 1: DCP Extinguisher

5.1 ITEMS TO BE INSPECTED ON A MONTHLY BASIS:

- All fire equipment should be numbered and entered in a register. The number should also appear above the mounting to ensure correct placement;
- Make sure that the extinguisher is in its assigned position;
- Make sure that the symbolic signs indicating the position of the Fire Equipment are understandable and visible;
- Make sure that nothing is stored under the Fire Equipment and that it is not obstructed;
- Inspect the discharge nozzle of extinguisher and hose reel for damage and ensure it is not blocked;
- Inspect the discharge hose for cracks and cuts;
- Ensure that the instruction label is legible and face outwards;
- Check that the tamper seal is in good order and that it has not been tampered with;
- Check the pressure gauge (needle indicator) on extinguisher (if fitted) is in correct pressure (green area) approx. 1500kpa;
- Check the service date making sure that the fire equipment has not missed a service (service annually);
- Check date of last hydrostatic pressure test;

Personnel making inspections should keep a record of inspections, including those found to require corrective action. The record should include the date the inspection was performed, and the identity of the person conducting the inspection.

NOTE: Should any unit show signs of damage or interference, it must be reported and withdrawn immediately and replaced with an operable one (stand-by) of the same kind and size.

(See monthly Fire Equipment Inspection register and fault log, sample documents).

6 CONCLUSION

This article explored the types and suitability of workplace fire extinguishers. It was found that in general use buildings, Occupancy class G1; offices, banks, consulting rooms and other similar usage, 4,5 kg Dry Chemical Powder fire extinguishers placed at a height of 1,2 meters (or waist height) are ideal unless otherwise specified. DCP fire equipment offer excellent attributes such as general availability, competitive pricing, ability to extinguish multiple types of fires and ease of maintenance.

Note: this article is not intended to equip any person to use fire equipment in a work setting. Frontline SHEQ can provide further training on the use of firefighting equipment which are in line with SAQA US ID: 110075 and SAQA US ID: 252250 upon request.



7 PICTURES



Figure 1: Water Type Extinguisher



Figure 2: Foam Fire Extinguisher



Figure 3: Dry Chemical Powder Fire Extinguisher (DCP)



Figure 4: Carbon Dioxide Fire Extinguisher



Figure 5: Halon Fire Extinguisher