

FIRE EXTINGUISHERS:

UNDERSTANDING FIRE EXTINGUISHERS

DEFINITIONS, DESCRIPTIONS, SIZES, TYPES, CLASSES AND MEDIUMS

Call emergency services: 0800033911 for assistance.

Remain calm but act quickly

This documentation is merely guidelines, suggestions or recommendations and NOT a complete list of loss-control measures; it has been compiled from information obtained via the internet from various fire and safety sites to assist in the basic learning of fire safety. The information is NOT intended to replace manuals or instructions provided by the manufacturer or the advice of a qualified professional, nor is it intended to effect coverage under any policy.

FIRSTLY, ASK YOURSELF WHAT IS A FIRE?

You get two definitions of “what a fire is”, the scientist’s and the general public’s definition.

Generally people perceive a fire as a “scary, frightening occurrence involving red hot flames and toxic smoke that causes major devastation, destruction to property, injury to people, asphyxiation and even loss of life”.

Scientists look at fire from a very different point of view, scientists say that a fire is a chemical reaction called COMBUSTION, a process involving rapid oxidation at elevated temperatures accompanied by the evolution of heated gaseous products of combustion. When combustion occurs, substances such as wood, paper, oil or coal, also known as fuel (remember, all substances are made from chemicals, even paper), combine with oxygen in the air to produce toxic fumes and an incredible amount of heat. As heat is added, the ignition source, the fuel and oxygen molecules gain energy and become active. This molecular energy is transferred to other fuel and oxygen molecules which creates a chain reaction and could become an uncontrollable fire.

Combustion requires “help” from the activation energy (e.g. a spark, match) to kick off the reaction. Once combustion has occurred, the fire will continue “all by itself” until it is extinguished by either removing one of the elements of the fire triangle or assistance from aids such as fire extinguishers, fire blankets, fire hose reels.

The combustion process occurs in two modes:

➤ **The flaming**

➤ This occurs when solid and liquid fuels are vapourised. The solid fuel vapours are thermally driven off and the liquid fuel vapours evaporate. It is the volatile vapour from the solid or liquid fuels at burn in the flaming mode. This gas or vapour production emitted from the fuel is called pyrolysis.

➤ **The non-flaming, smouldering or glowing embers**

➤ This stage is a region of fully developed pyrolysis that begins with ignition and includes the initial stage of combustion. Invisible aerosol and visible smoke particles are generated and transported away from the source by moderate convection patterns and background air movement.

WHAT IS A FIRE EXTINGUISHER?

- A portable or hand held cylindrical pressure vessel
- Metal container / device
- An active fire protection device
 - It holds a rechargeable agent/medium that assists with the extinguishing of fire

WHAT DOES A FIRE EXTINGUISHER DO?

- Discharges an agent, whether it is a jet of water, foam, gas, powder or other SABS approved materials to extinguish a fire (to extinguish a fire only use SABS approved fire extinguishers from a safe distance).
- Prevents further chemical reactions involving heat, fuel (e.g. wood, paper, flammable liquids) and oxygen* thus extinguishing the fire. * heat, fuel, oxygen is commonly known as the fire triangle.

WHO SHOULD HAVE A FIRE EXTINGUISHER?

EVERYBODY should have a fire extinguisher close at hand, not because your insurance company states your business OR home requires fire extinguisher, but because your life and your families is important.

Whether in your garage, while servicing your car; drag racing under the midnight skies; under your Lapa while having a relaxing braai, or in your kitchen while that undersized pot is making plenty French fries, we all need at least one.

**FIRE IS NOT RACIST NOR DOES NOT KNOW THE TIME.
IT CAN AFFECT ANYONE, RICH OR POOR.**

TYPES OF FIRE EXTINGUISHERS:


WHAT TYPES OF FIRE EXTINGUISHERS DO YOU GET?


- Stored pressure (STP)* (requires nitrogen to discharge agent)
 - *Pressure gauge fire extinguishers: in use today as gauge indicates pressure level
 - *Cartridge type fire extinguishers: these type fire extinguishers do not have a pressure gauge and therefore are obsolete or deemed condemned
- Gas

WHAT AGENTS/MEDIUMS DO YOU GET?

- Stored pressure (STP)
 - Dry chemical powder (DCP)
 - Foam
 - Water
 - D Class
 - K Class
 - Halon / BCF (obsolete / condemned)
- Gas
 - C02

STORED PRESSURE (STP):				
“STP” FIRE EXTINGUISHERS <u>WITHOUT</u> GAUGES				
(E.G. EMPTY CARTRIDGE TYPE FIRE EXTINGUISHERS) WILL BE CONDEMNED.				
GAUGE INDICATES WHETHER FIRE EXTINGUISHER IS FULLY CHARGED INCLUDING NITROGEN OR				
REQUIRES SERVICING OR RECHARGING				
<u>DCP</u>	<u>FOAM</u>	<u>WATER</u>	<u>WET CHEMICAL</u>	<u>“D” CLASS</u>
<u>DRY CHEMICAL</u>			<u>POWDER</u>	
<u>POWDER</u>				
				

<u>GAS</u>
<u>C02</u>
<u>(CARBON DIOXIDE)</u>


<u>GAS</u>
<u>HALON / BCF</u>
Now 'illegal' except for a few exceptions such as the Police, Armed Services and Aircraft
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <p><u>OBSOLETE</u></p> </div> <div style="text-align: center;">  </div> <div style="text-align: center;"> <p><u>OBSOLETE</u></p> </div> </div>
Halon fire extinguisher are a specialty type of fire extinguisher that contain a gas that interrupts the chemical reaction that takes place when fuels burn. This type of fire extinguisher is often used to protect valuable electrical equipment since they leave no residue.

TYPES OF FIRE EXTINGUISHERS:

(STP) STORED PRESSURE: DCP (DRY CHEMICAL POWDER) – Blue

<u>SUGGESTIONS WHERE TO MOUNT</u>	<u>Portable sizes</u>	<u>Wheeled sizes</u>
<ul style="list-style-type: none"> ➤ Homes ➤ Boats ➤ Vehicles ➤ Warehouses ➤ Factories ➤ Shops 	<ul style="list-style-type: none"> ➤ 600g ➤ 1.0kg ➤ 1.5kg ➤ 2.5kg ➤ 4.5kg ➤ 9.0kg 	<ul style="list-style-type: none"> ➤ 25.0kg ➤ 50.0kg ➤ 150.0kg



INFORMATION:

Dry chemical powder extinguishers are commonly known as “multi-purpose” fire extinguishers as they can be used on Class A, B and C fires. If you are going to use a DCP fire extinguisher on a gas fire, be sure to turn off (isolate) gas supply FIRST.

Agent: Monoammonium phosphate powder (MAP), ABC dry chemical powder (mix of monoammonium phosphate and ammonium sulphate).

The powder breaks the chain reaction of liquid and gas fires by coating the surface to which it is applied.

It is safe and effective for electrical fires as it is a non-conductor of electricity, however, the MAP powder could cause further damage the appliance.

Warning: when used indoors, powder can obscure vision or damage goods and machinery. It is also very messy.

(STP) STORED PRESSURE: Foam - Beige

<u>SUGGESTIONS WHERE TO MOUNT</u>	<u>Portable sizes</u>	<u>Wheeled sizes</u>
<ul style="list-style-type: none"> ➤ Petrol Bowers ➤ Flammable stores ➤ Fuel bulk tanks 	<ul style="list-style-type: none"> ➤ 9.0ltr 	<ul style="list-style-type: none"> ➤ 50.0ltr ➤ 150.0ltr



INFORMATION:

Foam fire extinguishers are applied to fuel fires to create a frothy blanket or seal over the fuel, this prevents oxygen from reaching the fuel.

Agent: Synthetic: AFFF foam (Aqueous film forming foams) is water based. They provide better flow and spreading over the surface and are effective due to faster breakdown of flames.

Protein foams contain natural proteins and are bio-degradable. They flow and spread slower and provide a foam blanket that is more heat-resistant and more durable.

Foam fire extinguishers are not recommended for fires involving electricity.

Carbon Dioxide (CO2) - Black

<u>SUGGESTIONS WHERE TO MOUNT</u>	<u>Portable sizes</u>	<u>Wheeled sizes</u>
<ul style="list-style-type: none"> ➤ Kitchens ➤ Admin offices 	<ul style="list-style-type: none"> ➤ 2.0kg ➤ 5.0kg 	<ul style="list-style-type: none"> ➤ 45.0kg



INFORMATION:

Carbon dioxide (CO2) fire extinguishers are ideal for fires involving electrical appliances and Class B liquid fires as the gas is non-conductive and when discharged does not leave any messy or sticky residue. Once released the “trapped” CO2 liquid becomes a gas rapidly cooling the surrounding air. As CO2 is extremely cold on release it can burn you, so BE CAREFUL when using CO2 fire extinguishers.

Agent: CO2 gas

Do not use CO2 fire extinguishers on flammable metals as well as paper, wood or cloth as the gas could blow the burning materials worsening the situation.

(STP) STORED PRESSURE: Water – Red

SUGGESTIONS WHERE TO MOUNT	Portable sizes	Wheeled sizes
➤ Thatched roofed houses ➤ Not commonly used but can be mounted in areas where it <u>WILL NOT</u> be used for any fires involving electricity	➤ 9.0ltr	➤ N/A



INFORMATION:

Water fire extinguishers cool burning materials. It is very effective against fires in furniture, fabrics, etc. Can safely be used in the ABSENCE of electricity.

Agent: Water

Do not use on combustible liquids, cooking oils and fats or electrical fires.

(STP) STORED PRESSURE: K Class / Wet chemicals – Beige

SUGGESTIONS WHERE TO MOUNT	Portable sizes	Wheeled sizes
➤ Kitchens ➤ Restaurants	➤ 9.0ltr	➤



INFORMATION:

Wet chemical fire extinguishers are ideal for extinguishing materials such as paper, furniture as well as cooking oil and fat fires.

Specialists for class F and D fires such as metal fires such as sodium, lithium, manganese and aluminium when in the form of swarf or turnings.

Agent: Wet chemical agent (e.g. foam / Potassium Acetate and Citrate)

Do not use on flammable and combustible liquids such as oil, petroleum or flammable gases as well as electrical equipment.

(STP) STORED PRESSURE: D Class (Dry powder) – Yellow fire extinguisher

SUGGESTIONS WHERE TO MOUNT	Portable sizes	Wheeled sizes
➤ Steel manufacturing factories	➤ 9.0kg	➤ 25.0kg ➤ 50.0kg



INFORMATION:

D class fire extinguishers are the only fire extinguishers recommended for Class D or combustible metal fires. D class fire extinguishers are similar to DCP (dry chemical powder) fire extinguishers except Dry powder (D class) fire extinguishers extinguish the fire by separating the fuel from the oxygen or removing the heat element of the fire triangle.

Agent: Sodium Chloride or Copper

Do not use on other class fires as these fire extinguishers.



CLASS OF FIRES: WHAT TYPE FIRE EXTINGUISHER FOR WHAT CLASS FIRE



CLASS	A	B	B	C	D	K
PICTURE SYMBOL						
TYPE	Wood, paper, fabric, rubbish, plastics, cardboard and any solid combustible materials.	Flammable liquids like fuel, kerosene, grease, paint or any non-metal in a liquid state.	Flammable gases like methane and propane.	Electrical equipment e.g. Computers, fax machines, motors, generators.	Flammable metals. E.g. magnesium, Lithium, Titanium, Sodium.	Vegetable fats and hot oils (catering equipment).
APPROVED FIRE EXTINGUISHERS:	A, A-B	A-B, B-C, A-B-C	A-B, B-C, A-B-C	B-C, A-B-C	BUCKET OF SAND	WET CHEMICAL
DRY POWDER	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> no
FOAM	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> yes
WATER	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> no
WET CHEMICAL	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> yes
"D"CLASS	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> no
Co2	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> no	<input checked="" type="checkbox"/> no

Class "K" fire extinguishers may require specific training, including when they should be used / not used. For example, the extinguishing agents in many Class "K" fire extinguishers are electrically conductive and should only be used after electrical power to the appliance has been shut off.

SUMMARY:	YES, USE ON:	NO, DO NOT USE ON:	IMPORTANT
DRY POWDER (DCP)	WOOD, PAPER, TEXTILES, FLAMMABLE LIQUIDS, GASEOUS FIRES		POWDER WILL CONTAMINATE CONSUMABLES, CAUSE POSSIBLE FURTHER DAMAGE TO SALVAGABLE EQUIPMENT AND USAGE WILL RESULT IN A MESSY AND TEADIOUS CLEAN UP
FOAM	WOOD, PAPER, TEXTILES, FLAMMABLE LIQUIDS	FLAMMABLE METAL FIRES, LIVE ELECTRICAL EQUIPMENT	
WATER	WOOD, PAPER, TEXTILES,	FLAMMABLE LIQUIDS, FLAMMABLE METAL FIRES, LIVE ELECTRICAL EQUIPMENT	
WET CHEMICAL	WOOD, PAPER, TEXTILES, FLAMMABLE LIQUIDS, GASEOUS FIRES LIVE ELECTRICAL EQUIPMENT		
"D"CLASS	WOOD, PAPER, TEXTILES, FLAMMABLE LIQUIDS, GASEOUS FIRES LIVE ELECTRICAL EQUIPMENT		
Co2	FLAMMABLE LIQUIDS, LIVE ELECTRICAL EQUIPMENT	WOOD, PAPER, TEXTILES	DO NOT USE IN CONFINED SPACES

CLASSES OF FIRE EXTINGUISHERS:



Class A Fire Extinguishers

contain water for use against fires involving ordinary combustibles like paper, wood, cloth and most plastics.



Class B Fire Extinguishers

use dry chemicals to put out fires caused by gasoline, oil and solvents.



Class C Fire Extinguishers

contain carbon dioxide for use against electrical fires.



Class D Fire Extinguishers

spray dry powder on combustible metals like magnesium, titanium, aluminum, sodium, and potassium.



Class K Fire Extinguishers

use a wet, potassium acetate-based, low pH agent to put out "cooking" fires in which there are animal or vegetable oils and fats.

WHAT TO DO IN AN EVENT OF A FIRE?

Some acronyms to help you remember what to do

REMEMBER: ALWAYS Remain CALM

FIRE:

F – Find the fire
I – Inform emergency personnel
R – Restrict the fire
E – Extinguish the fire / evacuate the building

CALM:

C – Contain the fire
A – Raise the alarm and alert the fire department
L – Learn your escape / evacuation route
M – Marshalls to take control
(Fire/first aid marshalls, health and safety officers)

RACE:

R – Rescue
A – Alarm / alert
C – Contain fire
E – Extinguish / evacuate

PANIC:

P – Pull the fire alarm
A – Activate firefighting equipment
N – Not possible causes
I – Immediately evacuate
C – Congregate at assembly point

SAFETY:

S – Sound the alarm
A – Assist personnel
F – Fight the fire
E – Evacuate building
T – Treat injured
Y – YOUR SAFETY IS IMPORTANT
(don't be a "hero" and go into a building, let the emergency services do their job)

SLICERS:

Sequential actions:

S – Size up
L – Locate the fire
I – Identify and control flow path
C – Cool the space from safety location
E – Extinguish the fire / evacuate the building

Actions of opportunity

R – Rescue
S – Salvage

RUN:

R – Remain calm
U – Use fire equipment if trained / safe to do so
N – Notify the emergency services

SPEED:

S - Sound the Alarm
P - Phone the Fire Department/Pull Station
E – Extinguish if Possible
E - Evacuate the Building
D - Direct the Fire Department to the fire

HOW DO YOU USE A FIRE EXTINGUISHER?

Acronym to help you remember what to do

REMEMBER: ALWAYS REMAIN CALM

BE PREPARED

BECOME FAMILIARISED WITH YOUR FIRE EXTINGUISHER

LEARN THE MANUFACTURERS LABEL, THE LABEL WILL INDICATE WHAT YOU NEED TO DO AND WHAT YOU CAN USE THAT SPECIFIC FIRE EXTINGUISHER ON

PASS:

- P – Pull off safety seal and pin
- A – Aim hose at base of fire (stand at safe distance)
- S – Squeeze handle
- S – Sweep from side to side

WHAT CAN YOU DO TO HELP PUT OUT A FIRE?

Starve the fuel source:

Remove or turn off the fuel

Fire requires fuel to burn, if you can starve the fire of fuel, it will extinguish

Smother the oxygen:

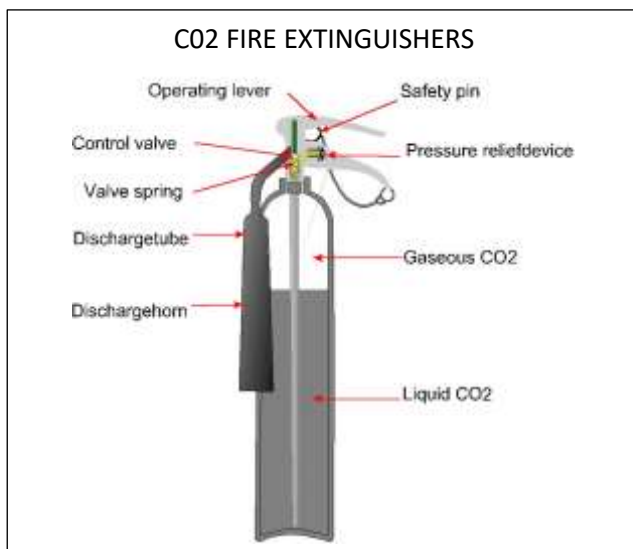
Remove the oxygen from the fire

Fire requires oxygen to burn, removing oxygen will make the fire more controllable

Cool the heat source:

Cool the heat

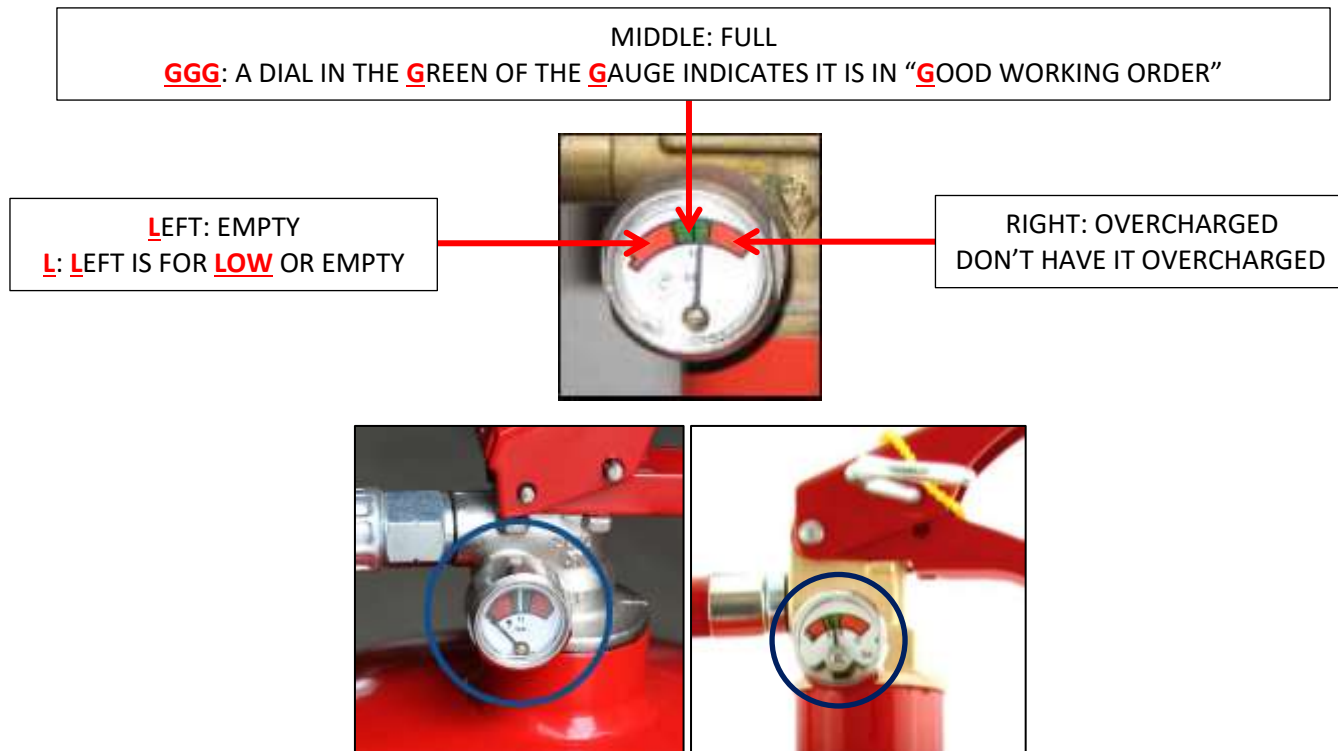
Cooling the source of ignition assists with the extinguishing of the fire



WHAT TO DO WHEN YOU HAVE USED A FIRE EXTINGUISHER OR SEE THAT THE PRESSURE GAUGE IS ON EMPTY?

Inform your health and safety officer or fire marshal (business) and/or contact your SABS approved service provider immediately so a safety check can be carried out, either to recharge the fire extinguisher or re-pressurize it with nitrogen.

The indication on a STP (stored pressure) fire extinguisher is that the pressure gauge is on the (red) left hand side.



As CO2 fire extinguishers have no pressure gauges to indicate if full or empty, the only way to confirm whether a CO2 fire extinguisher is full or empty is to weigh the fire extinguisher and compare the weight with that on manufacturer's instruction decal/label.

WHAT DO YOU NEED TO DO TO KEEP YOUR FIRE EXTINGUISHER IN WORKING ORDER?

- ▶ Regular (annual) maintenance / service intervals, to be carried out by registered SAQCC technicians
- ▶ Regular (monthly) inspections, can be carried out using a check list
- ▶ Contact your registered service provider if you see any faults

CHECKLIST

Type	: correct type for the specific area
Accessibility	: all fire extinguishers are in place and not missing
Location markings	: clear, visible, identification numbers on fire extinguisher corresponds to that on the wall
Location	: unobstructed
Demarcations	: clearly marked
Pressure gauges	: dial in the green (fully charged)
Cylinder condition	: no visible corrosion, dents,
Nozzles	: no cracks
Hoses	: no brittleness or inner hose showing
Condition of bracket	: no corrosion, securely fastened to wall
Handle	: no corrosion, upper and lower handle intact and secure
Safety seal	: sealed
Safety pin	: no corrosion and "through" the holes in the handle
Pressure/hydro test due	: is pressure test within required date
Service date	: within the required service date (annual service)
Manufacturers label	: totally intact, clearly visible and legible, correct label for type fire extinguisher

SERVICING YOUR FIRE EXTINGUISHER (portable)?

Have you checked when last your fire extinguisher was serviced?

Does your service provider have the correct accreditations or approvals E.g. SABS or SAQCC?

HOW TO CONFIRM?

- Check the SAQCC website (SOUTH AFRICAN QUALIFICATIONS AND CERTIFICATION COMMITTEE): www.saqccfire.co.za for your local registered company and qualified/registered service technician.
- Check the SABS website (SOUTH AFRICAN BUREAU OF STANDARDS): www.sabs.co.za for your local registered fire service provider.

WHO?

- A fire company who is SABS accredited (with an SABS mark)
- An SAQCC registered and valid service technician,

WHEN?

- As per SABS (SANS 1475 part 1 and 2) standards and regulations your fire extinguisher must be serviced every 12 months, unless the fire extinguisher is situated in an extremely high risk area for explosions, then servicing should occur every 6 months.

WHY?

- Servicing your fire extinguisher ensures that it is in good working order for when you really need it.

WHERE?

- Either at a service provider with an SABS approved workshop or an SABS approved mobile workshop.

HOW?

- Servicing is carried out as per SANS 1475 part 1 standards and regulations.

INDICATIONS THAT YOUR FIRE EXTINGUISHER HAS BEEN SERVICED

- A service label carrying the SABS and SAQCC mark, consisting of:
 - Service provider company name and details,
 - When it was serviced,
 - Next service date,
 - Service technician's SAQCC registered number, and
 - Condition of the fire extinguisher must be stated.

IS THE MANUFACTURERS INSTRUCTION DECAL/LABEL IMPORTANT?

Although the manufacturer's instruction label is sometimes overlooked, it plays an extremely important part of the fire extinguisher. The label assists in the following:

- It illustrates the size, weight, type and medium of the fire extinguisher
 - This allows your SAQCC registered and qualified service provider to correctly maintain and service your fire extinguisher, deeming it in good working condition should the event arise and you need to use it.
 - This enables the public, whether literate or illiterate*, to see what type of fire that specific fire extinguisher can be used on. *there are pictures and words showing usage

PRESSURE TESTING YOUR FIRE EXTINGUISHER?

STORED PRESSURE FIRE EXTINGUISHERS (STP):

WHEN?

- EVERY FIVE (5)YEARS : Dry Chemical Powder (DCP); Dry Powder (D Class)
- EVERY THREE (3)YEARS : Foam, Water, Wet Chemical

WHY?

- Pressure testing your fire extinguisher ensures that it is in good working order for when you really need it. To confirm that the stability of the fire extinguisher material has not been compromised due to elements, wear and tear, corrosion, etc.

WHO?

- ONLY a registered and qualified SAQCC service technician can pressure test a fire extinguisher in an SABS approved fire service provider's workshop.

HOW?

- Fire extinguishers are de-pressurized (nitrogen is released), agent is removed and fire extinguisher is pressure tested. Agent/medium is either re-used or replaced if necessary.

INDICATIONS THAT YOUR STP FIRE EXTINGUISHER HAS BEEN PRESSURE TESTED

- A pressure test label* carrying the SABS and SAQCC mark, consisting of:
 - Tested KPA
 - Pressure test date (year) must be stated.
- *no stamping can be made on STP fire extinguishers

WHY CONDEMN?

- Fire extinguishers are condemned due to dents, bad corrosion, unrepairable damage, no stocks available.

GAS FIRE EXTINGUISHERS (CO2):

WHEN?

- EVERY TEN (10)YEARS : CO2

WHY?

- Hydro testing your fire extinguisher ensures that it is in good working order for when you really need it. To confirm that the stability of the fire extinguisher material has not been compromised due to elements, wear and tear, corrosion, etc.

WHO?

- ONLY a SANAS accredited CO2 work station by accredited container inspectors within the company inspection bodies can carry out the hydro testing.

HOW?

- CO2 is released, head/valve is removed and cylinder is hydro tested. Cylinder is re-assembled and fire extinguisher is recharged.

INDICATIONS THAT YOUR STP FIRE EXTINGUISHER HAS BEEN PRESSURE TESTED

- A SANAS accredited container inspector will stamp the neck of the fire extinguisher with the SANAS approved marks, consisting of:
 - SANAS Accredited / approved company mark
 - Date and year of hydro test
 - A certification indicating all information required to either "pass" or "fail" the fire extinguisher

WHY CONDEMN?

- Fire extinguishers are condemned due to dents, bad corrosion, unrepairable damage, no stocks available.