



FIRE ASSESSMENTS • PREVENTION • DETECTION
SUPPRESSION • EQUIPMENT SUPPLY • TRAINING

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SAQCC Fire Certified Commissioner DG13/0332
SANS 10139 Part 1 and 2 Certified
Health and Safety U/STD 113852 Certified
Certified Programme- & Project Management
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Making the case for Oxygen Reduction Fire Prevention Systems (**FIRESAFE**)

Foreword

Fire systems are normally re-active, detecting smoke or heat and then signalling this through to a monitoring station and alerting those on site.

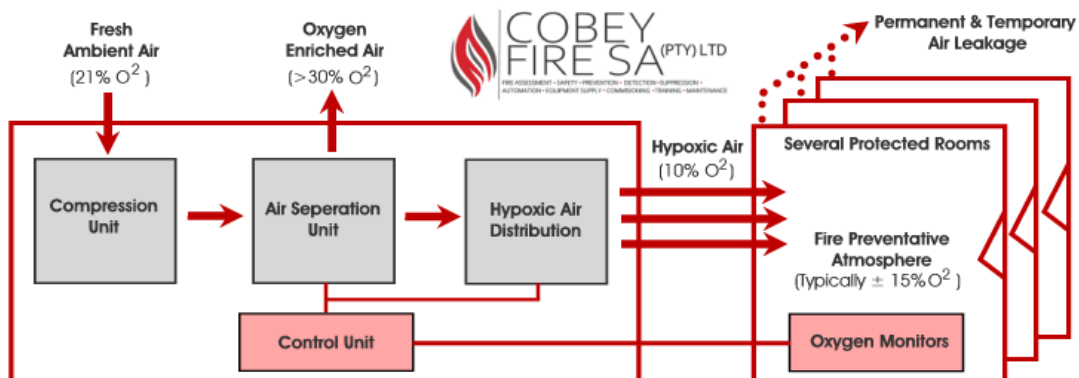
But in some structures, the use of traditional water, gas, aerosol, etc. in fire suppression can cause even more damage than the fire itself. For structures like these — such as data centres, server rooms, heritage buildings, cold storage, paper mills, and many more — there is great potential in Oxygen Reduction Fire Prevention Systems (**FIRESAFE**).

FIRESAFE can be seen both as a prevention and a protection fire safety measure. The traditional control or suppression fire systems are used once the damage has already occurred, the use of **FIRESAFE** will prevent a fire from igniting, improving business continuity and property protection.

Ultimately, the choice of the fire control or suppression systems should be based on the outcomes of a fire risk assessment, taking also into account the effects of the releasing phase of the extinguishing media on the occupants and on the property to be protected in case of fire.

How **FIRESAFE** work

- Ambient air is drawn into the **FIRESAFE** system where it is purified and turned hypoxic (low oxygen level).
- The entire room/space is ventilated with low-oxygen air, inhibiting fire ignition.
- Low oxygen air leaks from the room, thus completing the flow of air and ventilating the space.
- A control unit monitoring the room with oxygen sensors permanently ensures a stable and healthy low-oxygen environment in the room.



Is **FIRESAFE** safe for humans?

In terms of human physiology, breathing 15% oxygen concentration at sea level is equivalent to breathing normal atmospheric air (21% oxygen concentration) at an elevation of approximately 2700 metres. This equivalence is a result of the higher atmospheric pressure at sea level compared to that at altitude.

Large populations of people around the world live at altitudes well above 2700m without adverse effects. Similarly, occupants in a room protected by **FIRESAFE** at sea level experience, in terms of human physiology, almost equivalent conditions to passengers on commercial aircraft. As the altitude of a commercial aircraft increases, the cabin pressure systems are designed to limit the reduction in cabin pressure to the equivalent atmospheric pressure experienced at an altitude of 2,400 metres above sea level.

At this pressure, breathing cabin air, with 21% oxygen, is equivalent to breathing air with only 15.6% oxygen at sea level. It is also worth noting that oxygen-reduced environments at sea level are used in the training of elite athletes, especially those who will be competing in locations at high altitudes.

Advantages of **FIRESAFE**

With its ability to control temperature and humidity, **FIRESAFE** is ideally suited to protect valuables that are affected by oxidation, such as food, paper, paintings and certain metals. The most popular applications are in archives, vaults, computer facilities, warehousing and cold storage.

FIRESAFE is a revolution in fire safety, and the world's latest technological innovation in fire prevention. It has the unique ability to create an environment of breathable, controlled oxygen-reduced air that prevents fire ignition. Oxygen-reduction systems prevent fire proactively instead of suppressing a fire after it has started and damage and business interruption have occurred.

What you can expect:

- Active, preventive fire protection for the reliable protection of goods, facilities and employees
- Lower operating costs with simultaneous use of energy from the fuel cell
- Prevention of costly consequences of fire through smoke, soot, extinguishing water or gases
- Environmental protection through significant CO² savings, lower emissions and lack of need for extinguishing agents
- Reduced maintenance costs, since there are almost no moving parts in the fuel cell
- Quiet operation, as no compressor is required
- Planning freedom and saving on-site fire protection measures

Health & Safety

The design aim of any **FIRESAFE** system to create and maintain an atmosphere in an enclosure that is capable of preventing the ignition of combustibles found within the protected area while simultaneously remaining safe for the occupants.

A risk assessment should be carried out before any installation of a **FIRESAFE** system to ensure the safety of both people within the protected area and those outside the protected area that may be exposed to output air from the **FIRESAFE** system.

Such an assessment shall detail the safeguards employed for people having access to the protected space and **FIRESAFE** equipment.

It shall also specify the limitations to the number of people allowed in the protected enclosure and the level and duration of physical activity permitted to be undertaken.

Limitations on installation

FIRESAFE should not be installed for use in areas where:

- Sufficient infiltration control cannot be achieved.
- An alternative source of oxygen is present.
- Oxidizing agents exist that have the potential to reduce oxygen concentration by chemical reaction (for example, chlorine).
- Substances or processes exist that evolve gases capable of modifying the atmosphere such that the oxygen concentration is reduced (for example, toxic displacement).

Benefits of **FIRESAFE**

- Certainty of avoiding the outbreak and spread of fire.
- Continuous fire prevention without any interruption; no refilling or replacement required.
- Straightforward installation process compared with a sprinkler system or a traditional fire suppression system.
- Very small footprint and little building space required.
- Environmentally friendly – no chemicals used.
- Simple to install and maintain.
- Easily installed into existing premises as well as newly built spaces.
- Retaining access to protected areas at any time.
- Scalable to fit any sized area, large or small.

All traditional firefighting technologies or methods have the same problem in common, they are being used once the damage has occurred already.

Whatever media is in use, foam, water mist, sprinklers, gas or water they are being activated or used after a fire has been detected. With the common and known methods, fire is being fought only reactively.

In closing

Often the damage caused by the extinguishing media is worse than the damage caused by the fire itself. Furthermore, there are many applications such as data centres, server rooms, cold stores, archives and many more where the usage of water or gas would be fatal in its consequence.

We aim to provide the optimal solution for most of the above-mentioned applications to ensure absolute security by simply making the development of fire impossible.

Eliminating fire hazards and safeguarding people, buildings and their content is possible with **FIRESAFE**, it provides unmatched fire safety and achieves the ultimate goal in fire protection – fire prevention.

Our certifications ensure that the performance and quality of entire technology systems are protected, installed as per industry standards and within the agreed to budget.

Part of our innovation is our ability to keep an open mind and pursue all possibilities and alternatives.

We, therefore, prefer to sit around a table with our clients to co-operatively agree on the best solution for your business.

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