



Fire Protection Industry
(ODS & SGG) Board

ARTICLE

Fire protection in the building industry Identifying risks and understanding safety measures

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Understanding how the extinguishing agents in your gaseous fire suppression system are regulated under national law has many benefits including protecting your workers and the environment.

Commercial and industrial premises have many types of fire protection systems and equipment. These are for the most part, provided to meet the mandatory life safety measures required by law. In relation to fire equipment and systems, Australian Standards (AS) specify installation procedures and the correct location of fire extinguishers, among other things, and state that all fire equipment and systems including gaseous fire suppression systems are to be regularly tested, serviced and maintained. AS 1851 Routine service of fire protection systems and equipment sets out these requirements.

The objective of AS 1851 is to maximise the reliability of fire protection systems and equipment such that the systems and equipment meet the requirements of the relevant design, installation and commissioning standards and are likely to continue to do so until the next scheduled activity.

Due to the large number of Acts and Regulations regarding fire safety requirements that may apply, it would be advisable to check with local authorities.

Owners also often install additional systems voluntarily, or at their insurer's insistence, to further reduce risk to property. Gaseous fire suppression systems typically fall into this non-mandatory category. Gaseous fire suppression systems are installed widely throughout the building industry sector to protect facilities such as:

- computer rooms and data centres,
- switch rooms and motor control centres,
- process equipment,
- other business critical assets and systems.



These systems are typically installed so as to:

- protect high value assets,
- guarantee business continuity,
- safeguard people and processes.

Gaseous fire suppression systems are extinguishing agent storage cylinders coupled to a network of discharge pipework and nozzles that deliver the extinguishing agent to the room to be protected. They are typically installed with dedicated fire detection and control systems which provide an automatic discharge if a fire starts.

The extinguishing agents used in these systems are also sometimes referred to as clean agents because they don't leave any residue after discharge. This makes them particularly suited to protect delicate equipment, documents or artefacts.

There are two broad groups of gaseous extinguishing agents:

- Inert gases - are naturally occurring gases such as nitrogen, argon, carbon dioxide or combinations of these. They extinguish fires by reducing the available oxygen to a level below that which a fire needs to burn (typically less than 15%).
- Synthetic gases – are manmade manufactured gases and they extinguish fires by reducing heat and using chemicals to interfere with the fire chain reaction.

Both types of gaseous extinguishing agents have their own advantages and disadvantages. This means that choosing the most suitable fire extinguishing agent for a specific application will depend on a range of factors including their impact on the environment.

Environmental benefits due to the implementation of a national licensing system for the fire protection industry

One environmental consideration which building owners and those responsible for maintaining gaseous suppression systems should take into account when making a decision is whether the extinguishing agent used in their system are scheduled under the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989* (the Ozone Act) and the *Ozone Protection and Synthetic Greenhouse Gas Management Regulations 1995* (the Regulations). Scheduled extinguishing agents are those listed in the Ozone Act and include those synthetic gases that deplete stratospheric ozone, ozone depleting substances (ODS) agents that contribute to global warming and synthetic greenhouse gasses (SGG).

To minimise their environmental impact, the discharge of scheduled extinguishing agents, for anything other than putting out a fire, is strictly controlled. The Ozone Act and the Regulations govern the acquisition, possession, handling, use, storage and disposal of scheduled extinguishing agents used in the fire protection industry in Australia. The Regulations mandate the licensing of technicians who work on systems containing scheduled extinguishing agents.



In order to protect the environment, it is very important that all facility owners understand the potential environmental impacts of ODS and SGG if released into the atmosphere. To learn more about the effects of ODS and SGG, please visit the Department of the Environment and Energy website:

<http://www.environment.gov.au/protection/ozone>

It is mandatory that systems using synthetic gases are installed and serviced by an appropriate licensed technician under the Regulations. The Board strongly recommend correctly servicing and installing of all fire protection systems and equipment by trained and licensed professionals.

So which gaseous fire extinguishing agents are classified as scheduled extinguishing agents?

In the commercial/building sector the most common scheduled extinguishing agent in use is known by the trade names FM-200® or FE-227™. NAF S-III and NAF P-III are the trade names of other common scheduled extinguishing agents which are still present in some older systems. While FM-200 and NAF S-III are the most common scheduled fire extinguishing agents there are others. The main gases are:

Product name	Uses	Other name
FM-200® FE-227™	Function as total flooding agents. Typical applications could include chemical storage areas, clean rooms, communications facilities, laboratories, museums, robotics and emergency power facilities.	Heptafluoropropane HFC-227ea
Halon-1211	Typically used as a streaming agent. Requires a Halon Special Permit in Australia	Bromochlorodifluoromethane BCF
Halon-1301	Typically used as a total flooding agent. Requires a Halon Special Permit in Australia.	Bromotrifluoromethane BTM
NAF-P-III	Typically used as a streaming agent. It is: - A replacement for Halon-1211. - Effective on Class A, B and C type fires.	HCFC Blend C
NAF-S-III	Typically used as a total flooding agent. It is: - A replacement for halon-1301. - Effective on Class A, B and C type fires.	HCFC Blend A

Note: Inert gas fire systems that use argon, nitrogen gases, carbon dioxide, water mist etc. are not covered by the Ozone Act. However, the inclusion or omission of any extinguishing agent product from this list does not confer any form of endorsement or lack of endorsement of a product. The list simply identifies whether the Ozone Act applies to that product.

Under the Ozone Act, a scheduled extinguishing agent can only be discharged where the product containing the extinguishing agent is being use for its designed purpose. This will generally be in response to an actual fire. Discharge for testing or training is not permitted unless the person meets the requirements in the Regulations and has been granted a fire protection industry permit to do so by the Fire Protection Industry (ODS & SGG) Board (the Board).



Halon Agents – Essential uses

Halon agents (Halon 1301 - used in fixed systems, and Halon 1211 or BCF – used in portable extinguishers), are not permitted for anything but approved “essential use”. Essential uses involve situations where the halon is being used for a purpose that is necessary to protect human life or operate equipment that is critical to the community and there is no practicable and safe alternative to halon that is available at a reasonable cost and is likely to result in less damage to the environment. A Halon Special Permit granted by the Board is required in such cases. Essential uses are typically restricted to aviation and military applications. As a consequence, halon systems and BCF portable extinguishers must no longer be installed or used in building/commercial premises. If you are aware of a halon system installed in your facility (easily identified by its yellow cylinders) you should arrange for the system to be decommissioned and the cylinders sent to the National Halon Bank for disposal (Please call 1800 658 084).

Awareness and understanding of the use of systems and equipment

The building industry sector primarily uses FM-200 with some minimal use of NAF S-III. The use of FM-200 is due to its ability to act as a leading alternative to halons with the added benefit that FM-200 leaves no significant post discharge clean-up, obstruction on discharge or damage to sensitive equipment.

It is important that building owners, facilities managers and building occupants are aware if any gaseous fire suppression systems are installed within their building or facility to minimise the risks of discharges due to human error or equipment malfunction attributed to lack of adequate maintenance or understanding of the system.

So how can you identify one?

Rooms protected by gaseous fire suppression systems typically have warning signs installed on or above doorways into the room and close to other items of equipment which form part of the system.

If you work in a room protected by a gaseous fire suppression system it is important you understand how the system works. Some of the controls installed as part of the system are to allow the system to be discharged manually, if required in an emergency. Obviously these controls should only be operated in response to a fire. If you are not sure what a control does – don't touch it. It is also important to remember that most of these systems will operate automatically if fire or smoke is detected, so any activity which may cause the detection system to go into alarm (such as soldering or other activities which create clouds of dust or smoke) must not occur unless the gaseous fire suppression system has been isolated.

If you need training on how the gaseous fire suppression system installed in your facility works, speak with your supervisor or contact the fire service provider that maintains your system.



The Board has developed a factsheet covering the building industry sector including information specific to licensing requirements and risks associated with scheduled extinguishing agents. A copy can be downloaded from the Board's website on www.fpib.com.au/ozone.

Regular servicing and maintenance of gaseous fire suppression systems is essential, not only to ensure the system is fully functional in the event of a fire but also to ensure the safety of those working within the protected area.

Extinguishing agents are stored in cylinders under very high pressure. If these cylinders are not properly handled and maintained they can pose a significant safety risk due to the amount of stored energy contained within them. There have been cases of people being severely injured and even killed when cylinders have been accidentally discharged or mishandled.

In addition to the risks to health and safety, discharge of some scheduled extinguishing agents can also have detrimental environmental effects.

For these reasons it is very important that only competent, trained and in the case of scheduled extinguishing agents, licensed technicians (with the appropriate Extinguishing Agent Handling Licence (EAHL)), be allowed to install and maintain gaseous fire suppression systems. Under Ozone legislation, any person working on a gaseous fire suppression system that may cause the discharge of a scheduled extinguishing agent must hold an EAHL. Different entitlement types of EAHL cover specific activities such as system installation, testing, maintenance and the recovery, reclamation, filling and recycling of scheduled extinguishing agents.

The Fire Protection Industry (ODS & SGG) Board

The Fire Protection Industry (ODS & SGG) Board appointed by the federal Minister for the Environment, administers the fire protection division of the Regulations on behalf of the Australian Government. The Board exercises a range of powers and functions listed in sub regulation 311(2) in all states and territories in Australia, including to:

- receive applications and application fees for fire protection industry permits
- process applications within the 30 day time frame specified in the Regulations
- issue fire protection industry permits in accordance with the Regulations
- inspect premises as specified in the Regulations.

The Board also undertake the following functions outside of the requirements of the Regulations:

- provides customer service support to members of the fire protection industry and the general public
- provides a program of communication and awareness activities aimed at encouraging compliance with the fire protection industry permits scheme.

The Board provides ongoing information to the fire protection industry and the general public on its activities and purpose. This improves the awareness and understanding of scheduled extinguishing agents, the legislative requirements surrounding them and the need to reduce their use and the potential risk for accidental emissions.



In Summary

For a gaseous fire suppression system to operate effectively and efficiently, the Board recommends that:

- Owners of gaseous fire suppression systems use a maintenance log book to record all maintenance activity. The use of logbooks will establish a process for documentation and provide a full life-cycle chain of custody documentation for all installed systems. A log book would record all maintenance activity and record the details of the licensed technician who is servicing the system.
- Ongoing maintenance of systems to greatly improve the efficiency and longevity of the system.

The Board has also published the *Ozone Depleting Substances and Synthetic Greenhouse Gases (ODS & SGG) Good Practice Guide* and a building industry factsheet.

If your facility has a gaseous fire suppression system which contains scheduled extinguishing agents you are encouraged to download a copy of *the Good Practice Guide* and the factsheet from www.fpaa.com.au/ozone. The guide and factsheet provides additional information on your obligations under the Regulations and further details on the issues discussed in this article.

Finally, if you would like further information in relation to this article or wish to contact the Board, please contact Julia Nicolas, Communication and Compliance Coordinator at julia.nicolas@fpaa.com.au or (03) 8892 3131.

