

Argonite

Inert Gas Fire Suppression

Argonite is an inert gas which is used as a fire suppressant based on the principle of oxygen depletion.

In an enclosed space Argonite reduces the oxygen concentration to approximately 12.5% which is considered to be an acceptable level for human exposure over short periods provided the system is correctly designed.

Argonite is effective against fire in almost all combustible materials and flammable liquids and is particularly suitable for use in areas where the application of water, foam or powder is unacceptable. It is however not suitable for fires in substances that generate oxygen.

Composition

Argonite is a 50:50 mixture of two pure inert gases, argon (Ar) and nitrogen (N₂). Both gases occur naturally in the atmosphere. Discharge gas has a similar density to air.

Argonite is a colourless, odourless gas. It only contains naturally occurring substances, is environmentally neutral, has zero ozone depletion potential and zero global warming potential.

A gas discharge does not result in a fogging effect and there is no effect on visibility. This will ensure safe egress from the protected enclosure in an emergency. It is also electrically non conductive.

When Argonite is discharged into an enclosed space, an inactive atmosphere is established in which the oxygen concentration is decreased from the normal 21% to 12-13% by volume. This oxygen concentration will not normally support combustion and we have fire extinguishment.

Applications

There are various applications for Argonite inert fire suppression systems including:

- Computer rooms
- Production control rooms
- Clean rooms
- Critical pieces of site
- Archive store rooms
- Data processing equipment
- Air traffic management centres
- Telecom centres
- Gas turbines



System Design & Operation

The system operates by physically removing oxygen from the atmosphere within the protected enclosure.

Tests indicate that Argonite does not decompose or produce any by-products when exposed to a flame and there are no known toxicological factors associated with its use.

Argonite systems are designed to extinguish fires with a concentration of approximately 40%. When suppression systems are designed correctly we can expect fire extinguishment within 60 seconds without the intervention of manual fire fighting. This is provided the system is designed correctly and that the protected area is not overly taxed with heavy combustibles and non essential storage. It is also paramount that the room is fire sealed in order to ensure that design gas concentrations are achieved for a minimum period of 10 minutes.

Argonite systems can consist of one or more gas storage cylinders connected via a common manifold. Storage cylinders are manufactured from high strength alloy steel. Systems can operate up to 300 bar pressure. Gas storage cylinders can be stored in excess of 100m from the protected area providing a degree of flexibility regarding their location particularly when space is at a premium. The protected enclosure should have an adequate integrity to retain the design concentration.

If more than one area within a building needs to be protected, this can be achieved by providing a single Argonite system designed to extinguish a fire in the largest room subject to adequate fire separation. The provision of automatic valves can allow the fire suppressant to be directed to the appropriate area. This will provide significant cost and space savings.

In relation to the design of the room, vents to external spaces must be automatically closed prior to agent release. Suspended ceilings must be clipped and secured in place. To limit the pressure in the enclosure to a maximum of 500pa there is a requirement to provide over pressure venting.

Approvals

Argonite has been approved and/or complies with major international authorities and classification bodies including:

- LPCB - UK

- NFPA – USA
- VDS – Germany
- DNV - Denmark

Installations should be undertaken in accordance with an approved standard such as BS ISO 14520:2015 and the requirements of the Authority Having Jurisdiction must be considered.

Key System Considerations

- There are numerous key system considerations which must be taken into account when designing, installing and maintaining gaseous fire suppression installations. These are substantially covered in the RiskFix Document - Gaseous Fire Suppression Systems.
- In line with the provision of any fire protection measure it is critical that the outline specification is submitted to AIG for review and approval in advance of installation.

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