



Kidde Fire Systems

Enhancing Data Center Fire Protection

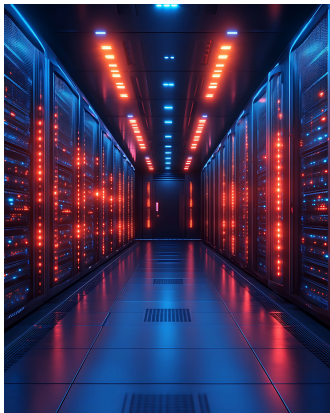
with Kidde Fire Systems NATURA™ Inert Gas Fire
Suppression System

Enhancing Data Center Fire Protection

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In the high-stakes environment of hyperscale data centers, where uptime and data integrity are paramount, fire protection must be both rapid and non-disruptive. Traditional fire suppression methods, such as those utilizing large water droplets, pose significant risks to sensitive IT infrastructure. This is where gaseous Clean Agent Fire Suppression Systems provide a cutting-edge solution—offering fast, effective fire suppression without damaging critical equipment or causing downtime.

Fire protection systems play a crucial role in safeguarding people, assets, and ensuring data center uptime. Data centers house critical IT infrastructure, and even a small fire can lead to catastrophic data loss, downtime, and financial losses. This white paper explores the advantages of using Kidde Fire Systems (KFS) NATURA™ Inert Gas system in data centers, outlining its effectiveness, reliability, and benefits over traditional fire suppression methods.



What is special hazard fire suppression?

Special hazard areas can be defined as:

- Any area containing equipment or processes of exceptionally high value
- Any area containing unique or irreplaceable assets (Data Centers, Data Halls, Server or records storage)
- Any area or process where the revenue produced or its function is of greater value than the equipment itself

Special hazard fire suppression systems are essential for mission-critical data centers, where even a minor fire event can lead to catastrophic downtime, data loss, and financial impact. Unlike traditional suppression methods, the KFS NATURA™ Inert Gas System solution provides rapid, non-disruptive fire protection without damaging sensitive IT infrastructure. The KFS system is designed to be highly efficient in detection and suppression and is able to contain fire threats instantly, ensuring uninterrupted operations, and business continuity.

Matching fire suppression to applications

Not all types of fire suppression are ideal for every application. That's where the experts come in. Fire Protection Engineers (FPEs) and fire system integrators (usually a local distributor with specialized expertise) will research the specific application and requirements of each building. Before recommending the type of suppression that best fits a building's needs, they look at what is being protected and where. For example, there are very different needs for a hyperscale

"From Data Centers to Power Plants: Kidde Fire Systems NATURA™/ Special Hazard Fire Suppression Prevents Catastrophic Losses"



Fire is every building owner's nightmare. Special hazard fire suppression systems disperse agents to suppress a fire in its incipient stage, before reaching the flame/heat stage that activates a fire sprinkler system.

data center versus an office building with multiple data closets. The system designers will also consider room location, volume and ventilation.

When it comes to fire code, the Authority Having Jurisdiction (commonly known as AHJ) plays a vital role in certifying that the fire and life safety systems in your building are up to date and meet the National Fire Protection Agency (NFPA) codes and standards. Since local application codes and standards can vary by geography, experts such as FPEs will help navigate these requirements as well.

Once an area or building is identified as a special hazard requiring additional protection, a multifaceted hazard analysis should be performed. Understanding types of potential fires and differentiating among Class A (combustible materials, such as paper or plastics), B (flammable liquids), and C (energized electrical equipment) ignition sources can aid in the selection of the most efficient detection and suppression technology for a building's specific hazards. A thorough review of potential ignition sources enables not only selection of an appropriate fire protection system, but the possible elimination of ignition sources.

Types of fire suppression

Automatic sprinkler systems are the most common type of fire protection required to meet building codes. In addition to the sheer amount of large droplet size water employed, the water used may be unclean or contaminated, risking further damage to a facility's critical assets.

In contrast, special hazard fire suppression systems are designed to detect and extinguish fires in locations where standard suppression systems are not appropriate or adequate. For this purpose, it's vital to choose the right type of fire suppression system for each application. Below is a look at a few options of special hazard fire suppression approaches, along with some best practice tips for each.

1. CLEAN AGENT SUPPRESSION

Clean agent fire suppression systems disperse inert or halocarbon gases to suppress a fire in its incipient stage, that is, before reaching the flame/heat stage that would activate a fire sprinkler system. In the event of a system discharge, the clean agent suppresses the fire in seconds without damaging equipment and property or endangering personnel.

The “clean” in fire suppression clean agents means the agents are electrically non-conducting and leave no residue upon evaporation. Because the agents do not impair breathing or obscure vision in an emergency situation, there is no health risk for building occupants.

Clean agent suppression is a good option for building owners requiring sustainability, occupant safety, and protection of assets.

Clean agents are removed from the hazard area by ventilation, meaning this suppression type allows a virtually immediate return to “business as usual”—without the interruption of a costly clean-up or the expense of damage to assets from residue.

Clean agents have been tested and found to be effective against the widest possible range of fires, including Class A surface (wood, paper and cloth), Class B (flammable liquids) and Class C (electrical) fires.

Best practice tip: Clean agent suppression is a good option for building owners requiring sustainability, occupant safety and protection of delicate assets such as hard drives. The ideal system for special hazards like these would incorporate a clean agent gas system or inert gas suppression systems.

KFS NATURA™ Inert Gas Fire Suppression System

The KFS NATURA™ Inert Gas Fire Suppression System is designed for environmentally safe and cost effective fire protection applications.

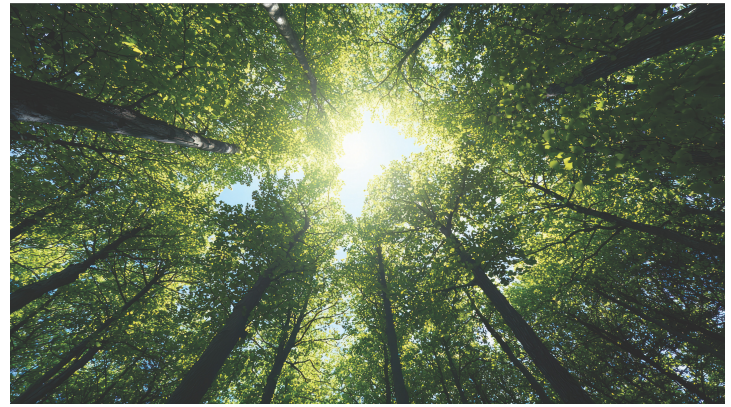
Here are its key benefits:

Flexibility:

- The system offers a choice of four agents IG-01 (Argon), IG-55 (Argonite®), IG-100 (Nitrogen), and IG-541 and can be installed in various environments, including commercial and industrial applications.
- Wide flexibility when selecting storage area as cylinders can be stored hundreds of feet from hazard.
- Suitable for rooms that are hard to seal and open spaces such as museums and labs.

Lower Costs:

- KFS NATURA™ features a pressure and flow regulating valve that allows for the use of Schedule 40 piping, and smaller area vents, reducing material and installation costs.



KFS NATURA™ Inert Gas: The Sustainable, Zero-Impact Fire Suppression Solution for a Greener Future

- Actuation up to 60 cylinders accomplished with a single release unit mounted on the primary cylinder so there is no need for separate pilot cylinders.
- Selector valves protect multiple hazards with a single cylinder bank, reducing overall system cost.
- Fast & easy installation using quick connect actuation hoses and electrical connections
- Economical agent refill cost after discharge

Safety:

- The system uses pure and blended inert gases that are safe for human exposure and have zero ozone depletion potential (ODP) and global warming potential (GWP).
- Safe for Human Exposure, people can breathe Inert gas blends at extinguishing concentrations below 52% for very brief periods of time during egress. There are no toxicological factors associated with the use of Inert gases as they will not decompose or produce any byproducts when exposed to a flame.
- Non -conductive - suitable for electronic equipment
- IG-01 (100% Argon)
- IG-55 (Blended 50/50 Argon & Nitrogen)
- IG-100 (100% Nitrogen)
- IG-541 (Blend Argon, Nitrogen, Carbon Dioxide)

NATURA™ Acoustic Nozzles

For use in applications requiring a system discharge generating a lower sound output than a standard suppression nozzle

- Quieter, reduces sound levels to below 110dB (between 500 Hz and 10 kHz when measured at 1m)
- Aesthetically pleasing alternative to bulky nozzle-silencer combinations
- Can replace existing discharge nozzles without major pipe modifications



ASPIRATED SMOKE DETECTION

Advantages of Using Aspirated Smoke Detection (ASD) in Data Centers:

1. Ultra-Early Smoke Detection

Detects smoke at the earliest possible stage, even before visible flames appear.

Provides pre-fire warnings, allowing time for proactive response and system shutdowns before damage occurs.

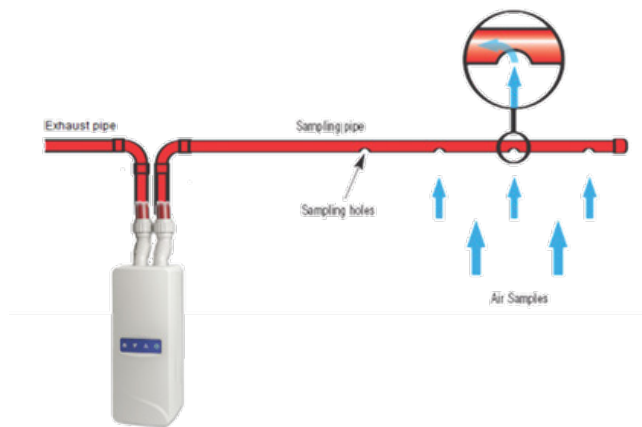
2. Prevents Downtime & Data Loss

Helps prevent catastrophic system failures by addressing fire threats before they escalate.

3. Superior Sensitivity & Accuracy

Uses laser-based air sampling to detect even the smallest smoke particles.

Can be programmed for multiple sensitivity levels to avoid false alarms.



ASD: Detecting Smoke Before Fire Becomes a Threat!

CONCLUSION:

Aspirated Smoke Detection is the standard in data center fire detection, offering early warning capabilities, reduced downtime risks, and integration with fire suppression systems. By detecting fire risks before they escalate, the ASD ensures maximum uptime, asset protection, and business continuity.

SUMMARY:

After fire prevention, special hazard fire suppression is a facility's best strategy for protecting business continuity, specialized equipment or irreplaceable assets. To determine the fire suppression agent best for a specific building, facility managers and owners can look to the expertise of FPEs and fire system integrators, as well as the unbiased expertise of equipment manufacturers that offer a complete range of fire suppression solutions.

Resources:

NFPA 2001: Standard on Clean Agent Fire Extinguishing Systems

NFPA 72: National Fire Alarm and Signaling Code®

About Kidde Fire Systems:

Kidde Fire Systems products and services set the benchmark for special hazard fire suppression. For over 100 years, we've been trusted to protect people and property from the danger of fires. That trust is reinforced by the quality we instill in everything we do, from manufacturing fire and safety systems to providing system design and technical support.



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