

Mission-critical fire protection

HI-FOG® for data centres





Modern fire protection



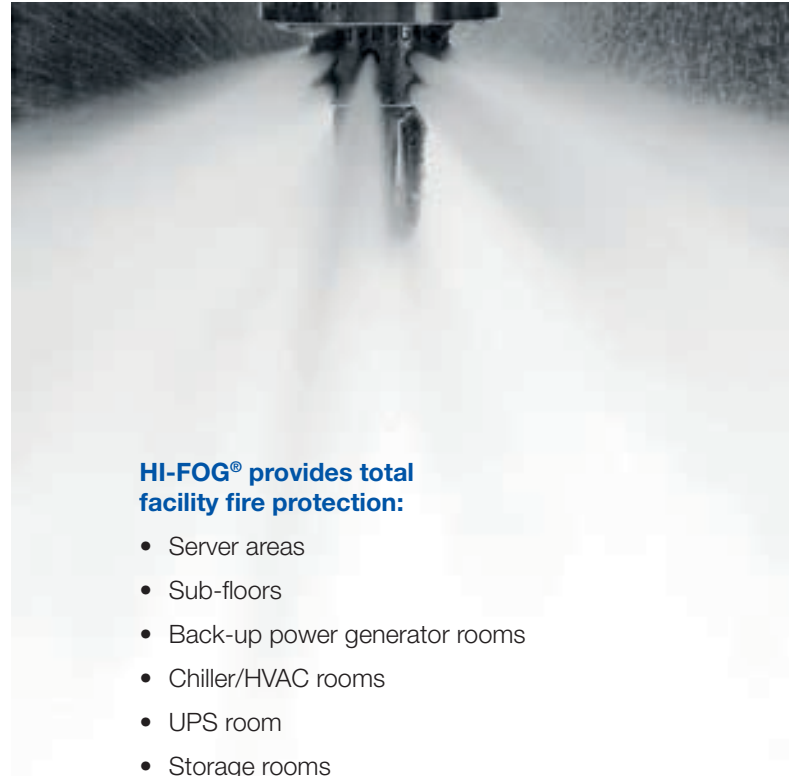
for a data-driven world

We make a strong case that HI-FOG® is the best available fire protection for mission-critical data operations and infrastructure. The proof is in the performance and the growing list of satisfied HI-FOG® data centre customers.

The HI-FOG® Water Mist Fire Protection System suppresses fire using the world's most widely available and environmentally friendly fire-fighting agent – water. It is entirely safe for people and the environment.

HI-FOG® uses special, patented nozzles to produce an extremely fine mist of micro-droplets representing water in its most effective fire-fighting form. The micro-droplets penetrate fire very efficiently, cooling the surrounding air effectively and blocking radiant heat, preventing the fire from spreading.

Fire, water, smoke and heat damage are minimized. Clean-up is fast. Business downtime is kept to an absolute minimum.



HI-FOG® provides total facility fire protection:

- Server areas
- Sub-floors
- Back-up power generator rooms
- Chiller/HVAC rooms
- UPS room
- Storage rooms
- Electrical rooms
- Common areas: corridors, meeting rooms, offices

A typical HI-FOG® system for data centres consists of:

- A high-pressure pump unit
- A small water supply tank (optional, depending on requirements)
- Section valves
- Small-diameter stainless steel tubing
- Fast-activating HI-FOG® sprinkler heads or spray heads



Synchronized to your business

HI-FOG® can be configured according to the modular design of modern data centres and your business requirements. HI-FOG® is easily expanded to protect new areas as your data centre grows: the tubing network is extended to cover the new areas and HI-FOG® sprinkler heads are added. The single, centralized pump unit can serve wide areas over long distances.

HI-FOG® is easily adapted to changing space requirements — in a single data centre, or across an international network of data centres. HI-FOG®'s flexibility is appreciated by many of Marioff's current data centre customers. It helps them evolve in step with the needs of their clients, some of whom are moving very fast indeed.



Part of environmentally sustainable design


HI-FOG® is green fire protection. It uses up to 90% less water than a traditional sprinkler system and offers equivalent or better performance. It is a clean system that uses plain, potable water (no black water problems). It consumes little electricity and does not impose special requirements on your building.

HI-FOG® is made of high-quality materials for long system life, low maintenance and a minimized risk of leakage and false discharge. Stainless steel HI-FOG® tubes are much narrower in diameter than traditional sprinkler system pipes: 12 mm tubes will typically make up two-thirds of a HI-FOG® system.

HI-FOG®'s low water requirement, low space requirement and low system weight give design consultants and system engineers precious room to maneuver in coming up with impressively green data facility solutions. If green building design is about turning small, incremental savings into big savings over time, HI-FOG® can help point the way.

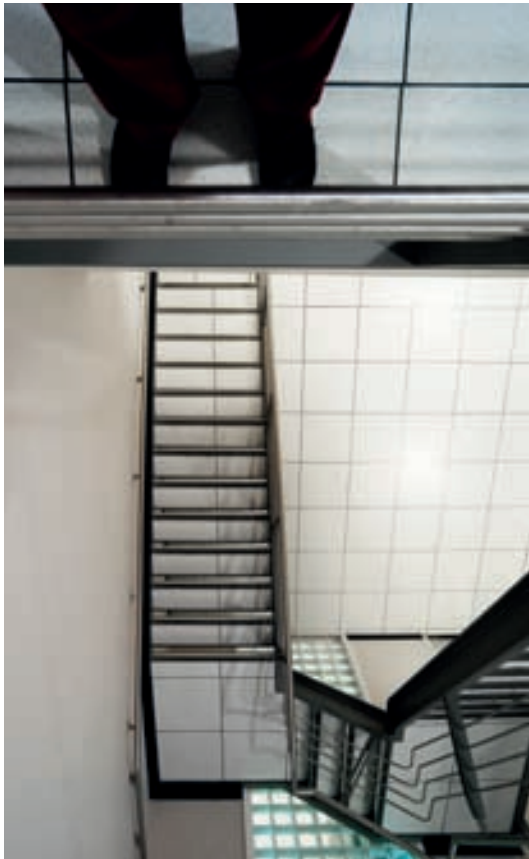


HI-FOG® maximizes water's fire fighting capability by generating a very large surface area of water within the volume of space. HI-FOG® water mist is unparalleled in its ability to attack two of the three pre-requisites of fire – heat and oxygen (the combustible material being the third) – while being harmless to people and the environment.

	Typical drop size range (mm)	Number of droplets per litre of water	Surface area (m²)
	1...5	15 thousand to 2 million	1...6
	0.2...1	2 million to 250 million	6...30
	0.025...0.2	250 million to 150 billion <small>Superior cooling and local inerting</small>	30...250 <small>Superior blocking of radiant heat</small>

The view from

A walk through the LD4 IBX®



Marioff is a preferred fire protection solution supplier to Equinix in the UK. HI-FOG® protects six Equinix data centres in Europe, four in the London area.

HI-FOG® protects Equinix's LD4 International Business Exchange™ (IBX®) data centre in the west London area, a showcase facility in the industry. Built from the ground up for Equinix with every detail carefully considered, the result is one of Europe's most advanced data centre environments. A dry-pipe HI-FOG® system provides total facility protection with:

- A GPU6 pump unit
- 1,200 HI-FOG® 1000-series sprinklers
- 18 section valves
- 12 mm and 30 mm tubing

Equinix UK

data centre



The system protects all the critical data centre space and the UPS rooms, covering two floors over an area of 13,800 m².



Gas-based fire protection systems are commonly used in the UK for data centre fire protection. Equinix believes that HI-FOG[®] offers important advantages over such systems:

- It does not require alterations to be made to the building fabric in order to accommodate the large pressure changes experienced with gas discharges
- HI-FOG[®]'s system footprint is much smaller than that of gas systems
- Installation is fast and cost-effective with no loss in quality

Protecting data centres



CX2 Cyberjaya science township, Kuala Lumpur, Malaysia

This data hotel, the largest of its kind in South-East Asia, provides outsourcing services with two interconnected wings of 5 and 6 storeys. A HI-FOG® system composed of wet-pipe, deluge and pre-action sections protects roughly 95% of the facility: 9,000 m² of server areas, sub-floors, a back-

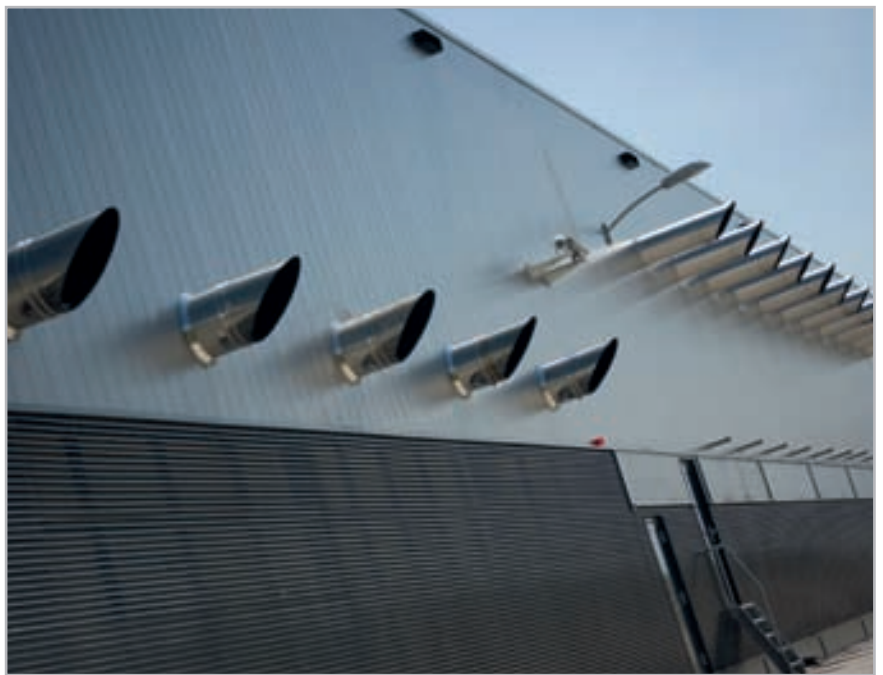
up power generator room, electrical rooms, UPS rooms, offices and public areas. The system comprises an SPU4 pump unit, 2,800 HI-FOG® sprinkler heads and spray heads, and 17 section valves. HI-FOG® was chosen due to Marioff's reputation as a trusted partner and its reference list of satisfied data centre operators.

around the world



Telecity IV data centre, Amsterdam, the Netherlands

A wet-pipe HI-FOG® system protects the high-value spaces: five server halls and the power generation areas. Both the “hot” and “cold” isles are protected in the data spaces. HI-FOG® was selected over competing technologies because it could be used to protect all the identified risk areas.



TCN Eemsdelta Data Centre, Eemshaven, the Netherlands


This facility is the largest and most advanced data storage and hosting centre in the Netherlands, with free air cooling and green energy technology.

HI-FOG® protects the entire building. It was chosen for its performance, economic feasibility and suitability for the location.





A trusted partner



A number of leading data centre operators have joined forces with Marioff to neutralize the threat of fire. This is a long-term proposition, and Marioff supports HI-FOG® over the complete life-cycle of the system.

Design services

Marioff will design the right HI-FOG® system for your data centre based on the size of the areas to be protected, your need for modularity, and any special requirements such as sub-floor protection.

Installation

Marioff and its partners are expert at installation. In a working data centre, HI-FOG® is installed wing by wing and space by space in accordance with your operations.

Low maintenance costs, long system life

The HI-FOG® system is made of high-quality components and stainless steel tubes to ensure long system life and minimal maintenance costs. Marioff provides a full palette of services to ensure that your HI-FOG® system stays in peak operating condition throughout its lifecycle.

Environmentally friendly

HI-FOG® uses very little water to ensure environmentally safe and responsible performance. The system will not fall foul of future environmental regulations.

Training

As part of your overall safety and security regimen, Marioff will train your staff to operate the HI-FOG® system to make sure it performs at its best when it really matters — all the time.

Regulatory background



HI-FOG® development is based on full-scale fire tests that are evaluated by independent, third-party authorities. Since its launch in 1991, HI-FOG® has received over 100 type approvals as a result of over 6,000 full-scale fire tests conducted to date for marine, building, industry and energy applications.

HI-FOG® systems for buildings are designed and installed according to the NFPA 750 Standard on Water Mist Fire Protection Systems. HI-FOG® systems for the fire protection of buildings have system approvals for the following sprinkler classes:

- Light hazard (FM)
- Ordinary hazard 1 (VdS)
- Ordinary hazard 3 (VdS)

FM and VdS approval

Additionally, HI-FOG® systems for the protection of the following hazard areas relevant to data centre operations have been approved by FM Global, VdS or the IMO:

- Machinery spaces
- Car parks (OH2)





HI-FOG® 1000-series
sprinkler



HI-FOG® 2000-series
sprinkler



HI-FOG® spray head



Shown actual size: 12 mm tube to the HI-FOG® sprinkler/spray heads



Shown actual size: 30 mm tube



Gas-driven pump unit (GPU)



SPU8 electric pump unit. Provides constant flow of 140 bar pressure during activation. Can be reset quickly and automatically after a discharge.



Head Office

Marioff Corporation Oy
Virratie 3
FI-01301 Vantaa, Finland
Tel. +358 (0)9 8708 51
Fax +358 (0)9 8708 5399
Email: info@marioff.fi



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