

Maximum security fire protection
HI-FOG[®] for prisons and detention centres



Ensuring cell tenability

The HI-FOG® Water Mist Fire Protection System is well-suited to the rigorous security regimens and special fire fighting protocols of prisons and detention centres. If a fire is detected inside a cell, health and safety protocols give strict guidelines for ensuring the safety of officers fighting the fire and rescuing of the inmate.

These guidelines may require the inmate to remain in the cell for up to 15 minutes after the fire alarm is issued – the time required to investigate the alarm and assemble the officers needed to enter the cell.

This period is a very long time in fire fighting terms, during which the fire must be suppressed while the inmate is protected. The HI-FOG® Water Mist Fire Protection System allows you to accomplish this: it suppresses and controls the fire, maintains a tenable environment in the cell, and allows officers to rescue the inmate safely.

The following are typical parameters for cell tenability as set by leading prison authorities:

- Maximum carbon monoxide (CO) concentration of 1,500 ppm
- Maximum carbon dioxide (CO₂) concentration of 5%
- Oxygen (O₂) concentration to stay above 14%
- Maximum temperature 80°C

The HI-FOG® Water Mist Fire Protection System has been tested in third-party, full-scale fire tests simulating the prison cell environment. The following was confirmed in fire tests lasting as long as 20 minutes:

- CO concentrations stayed below 1,500 ppm
- CO₂ concentration did not exceed 2%
- O₂ concentration did not go below 17%
- Temperature after system activation ranged between 20°C and 30°C

HI-FOG® for prisons comprises the tamper-proof HI-FOG® prison nozzle, hydrants (optional), tubes and fittings, section valves, a pump unit and release panels. In addition to the in-cell protection, the system can protect the prison recreation areas, stores, kitchens and administration areas using HI-FOG® 2000-series sprinklers and the same pump unit.

in case of fire



HI-FOG® prison nozzle

The HI-FOG® prison nozzle is tamper-resistant thanks to its pop-out design. While inactive, the nozzle piston is recessed and flush with the assembly body. It pops out only during system activation. Its design prevents the attachment of ligatures. The HI-FOG® prison nozzle can be wall-mounted or ceiling-mounted according to the cell layout as you require.

Low water usage, little water damage, short cell downtime

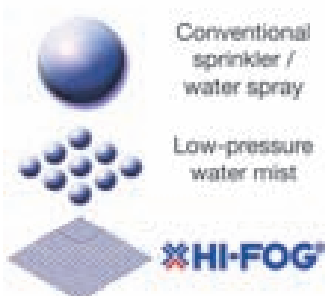
Typically the HI-FOG® prison nozzle will use about 35% or less of the water used by a traditional institutional water sprinkler and the HI-FOG® mist discharge is much cleaner. With HI-FOG®, cell turn-around time following discharge is much shorter, and the cell and its contents will be less damaged.



Conventional sprinkler systems are good...

Conventional sprinkler systems work. They suppress prison fires, saving lives. The damage they leave behind in the aftermath of a fire is a secondary consideration. The primary consideration is that the fire is out. At Marioff we recognize that conventional sprinklers protect against prison fire, but we make the case that HI-FOG® is the best fire protection a prison or detention centre can have. HI-FOG® deals with prison fire more effectively and safely than conventional sprinkler systems.

HI-FOG® uses up to 90% less water than a conventional sprinkler system when it activates. This is enormously beneficial both in case of fire and in case of accidental activation.



Typical drop size range (mm)	Number of droplets per litre of water	Surface area (m ²)
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 <i>Superior cooling and local wetting</i>	30...250 <i>Superior blocking of radiant heat</i>

The smaller the water droplet, the greater the surface area of the water in the volume of space and the greater the system's fire fighting effectiveness. HI-FOG® water mist is unparalleled in its ability to attack two of the three things that fire needs to grow – heat and oxygen (the combustible material being the third) – while being entirely harmless to people and the environment.

HI-FOG® is better



Suppresses shielded fires

The excellent fire-fighting performance of HI-FOG® has been proven in over 6,000 fire tests to date and the system's track record in marine and land-based installations is exemplary. In the prison environment, HI-FOG®'s "3D performance" is especially important – its ability to suppress shielded fires, such as those that occur under bunk beds, is unsurpassed.

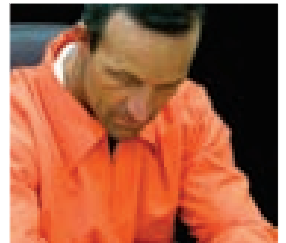
HI-FOG® hydrant

The HI-FOG® hydrant is used to extinguish fires manually. If a cell fire occurs, the hydrant can be used to extinguish the fire either by entering the cell with it or by jetting through the cell door openings. The jet can be adjusted to be either a fine mist or a strong, long jet; in either case, a protective cone of spray protects the user from the heat. The HI-FOG® hydrant comes as standard with a 25 m hose mounted on a spring-loaded reel.



Holistically HI-FOG®

The HI-FOG® Water Mist Fire Protection System will help you operate your prison or detention centre safely by minimizing the threat posed by fire. This is a long-term proposition, and Marioff supports HI-FOG® over the complete lifecycle of the system.



Design services

Marioff will design the right HI-FOG® system for your prison or detention centre based on the number of floors, number of cells, and any special requirements like deep-fat fryer or duct protection in the laundry and kitchens.

Installation

Marioff and its partners are experts at installation. In a working prison, HI-FOG® is installed floor by floor and wing by wing, scheduled in accordance with your operations to ensure safety. Because HI-FOG® uses very little water, it requires very little space. HI-FOG® tubing is much smaller in diameter than conventional sprinkler piping (as small as 12 mm).

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 condition throughout its lifecycle.

Environmentally friendly

HI-FOG® uses very little water (potable, supplied through the regular mains) to ensure environmentally safe and responsible performance. The system will not fall foul of future environmental regulations.

Training

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



The world's pre-eminent water mist company

Founded in 1985, Marioff is the world's leading provider of water mist systems on land and at sea. Almost 1,000 passenger cruise ships, ferries and other marine vessels are protected by HI-FOG® at sea. About 1,500 installations are protected by HI-FOG® on land: heritage buildings and museums, hospitals, libraries and archives, IT and telecommunications

facilities, energy facilities, road tunnels, metro trains and stations, factories – the list is long and growing fast.

Relentless fire testing

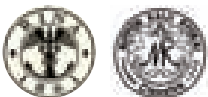
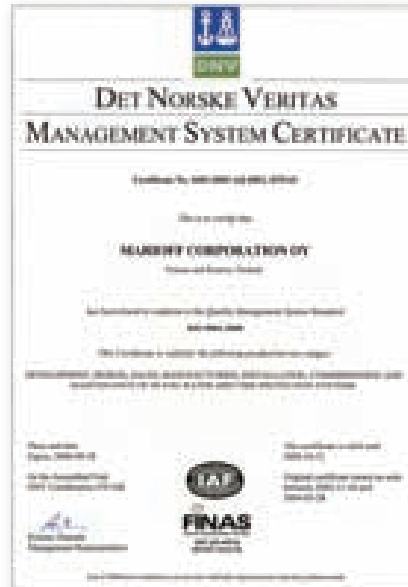
With over 6,000 full-scale fire tests behind it, the HI-FOG® Water Mist Protection System is the world's most tested water mist system. HI-FOG® has been tested for prison and detention

centre fire protection and its performance in these environments is a known, impressive quantity.

World's most approved water mist system

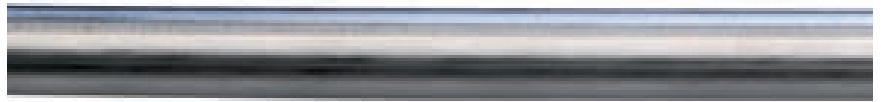
HI-FOG® has received more type approvals, across more application areas, than any other water mist system.

A short selection of HI-FOG® approvals

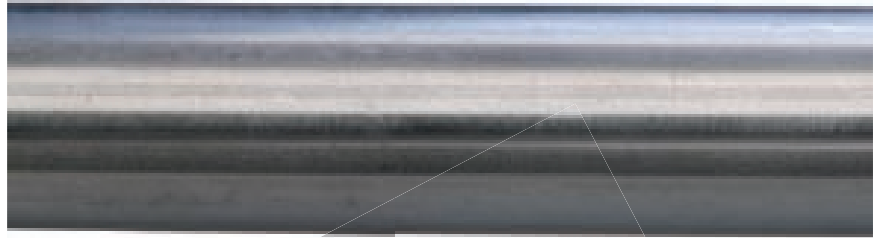




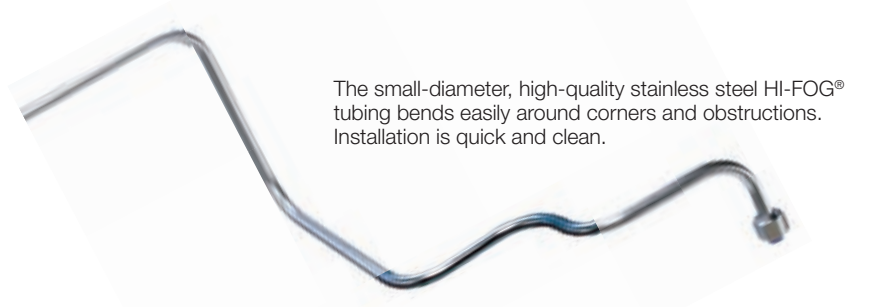
The NS12 section valve is small and easily installed on a wall close to the cells. It is remotely controlled by a 24Vdc 22W signal emitted by either the fire detection system or a release panel. Manual activation is accomplished by turning the manual release wheel on the NS12 valve itself. For in-cell protection, the number of valves is dependent upon the number of cells in which the water mist needs to be discharged simultaneously: typically, this will range from simultaneous activation in 4 cells to activation in a single cell.



12 mm stainless-steel HI-FOG® tube.
Final tube to the sprinklers. Actual size.



30 mm stainless-steel HI-FOG® tube.
Main tube from the pump unit. Actual size.



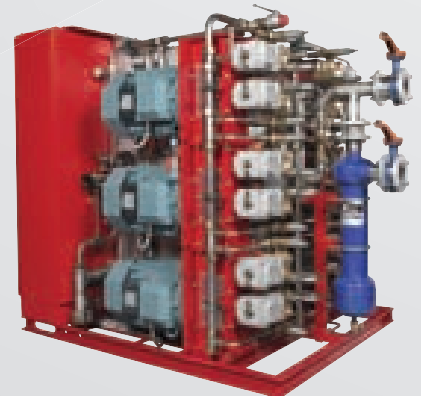
The small-diameter, high-quality stainless steel HI-FOG® tubing bends easily around corners and obstructions. Installation is quick and clean.



HI-FOG® prison nozzle in normal position



HI-FOG® prison nozzle in discharging position



The HI-FOG® high-pressure, electrically-driven pump. Standard option for large prisons and detention centres. Provides a constant flow of 140 bar pressure during activation. Can be reset quickly and automatically after a discharge.



Head Office

Marioff Corporation Oy
P.O. Box 86, FI-01301 Vantaa, Finland
Tel. +358 (0)9 8708 51
Fax +358 (0)9 8708 5399
Email: info@marioff.fi



Austria • Canada • Finland • France • Germany • Italy • Russia • Spain • Sweden • UK • USA

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