



FIXED EXTINGUISHING SYSTEM

with FM-200®  
EXTINGUISHING AGENT

FIRE  
PROTECTION

# THE IMPORTANCE OF EFFECTIVE PROTECTION



Any company or institution has a need to protect its assets, safeguarding them against possible fires. This is an essential issue since this type of incident can cause a shutdown or destruction of the business, with serious consequences.

To do this, fixed extinguishing systems using FM-200® were developed to provide continuous protection while minimizing potential damage from the fire, and avoiding damage to the ozone layer (zero OPD).

The equipment must be activated rapidly and

efficiently at the first signs of alert. SIEX-HC™ 227 was developed with these criteria for complete and safe extinguishment.

Protection should be tailored to each need, seeking the best solution for an optimal design. SIEX designs systems to suit any project, regardless of complexity. We are committed to guaranteeing this efficiency.

# VERSATILITY WITH NO COMPETITION

SIEX-HC™ 227 is notable for its versatility in the protection of the widest range of hazards. It combines high efficiency and extinguishing capacity with excellent performance, making it currently the most required and marketed system worldwide.

The key to its success lies in providing harmless and very fast extinguishment (discharging in 10 seconds) to protect the contents of a room and its occupants. The primary objective does not consist of ensuring structural integrity (unlike sprinklers, which act by cooling ceilings, columns and walls) but not allowing the fire to spread and acting in the first moments, thus ensuring the integrity of the whole.

Other systems are activated by the fire at a later stage: Extinguishment is just as effective, but comes about when much of the goods are damaged beyond repair.

Furthermore, as a clean agent, it leaves no residue requiring cleaning after the fire. Resumption of activity can be IMMEDIATE, once the area has been ventilated, thanks to the protection of data, equipment and furnishings.

**SPEED OF RESPONSE  
DETERMINES THE EXTENT  
OF DAMAGE.**

**THE MOST USED CLEAN AGENT. FM-200® PROVIDES THE MOST RELIABLE AND COST EFFECTIVE PROTECTION.**

Recognition by prestigious international organizations, most notably VdS, UL and FM, underwrite the quality of the equipment.



The technical department of SIEX is equipped with advanced specialist software which is essential for correct design calculations. It provides comprehensive advice at each stage, seeking to optimize and adapt to each project constraint or client requirement.

*Complies with current standards ISO 14520, UNE 15004-5 or NFPA 2001 (depending on the country of installation)*



# REASONS FOR CHOOSING

## SIEX IS A REFERENCE COMPANY FOR THE PROTECTION OF ALL TYPES OF HAZARDS

The use of SIEX-HC™ 227 is suitable for a wide variety of hazards. It is installed using light weight piping and simple fittings, thanks to the low storage pressure.

Among the most widespread applications, it is ideal for use in occupied areas such as: computer rooms, telecommunications, offices, archives and museums; but also warehouses, petrochemical facilities, electrical fires, electrical panels and explosion suppression.

CUSTOMIZABLE PRESSURES

STABLE EVEN THOUGH  
CHANGES ARE MADE

### SIEX PROVIDES EQUIPMENT FOR A WIDE RANGE OF WORKING PRESSURES

The system is effective on both large and small fire and its range of pressures is a basic advantage:

Depending on constraints such as the distance between the hazard and the storage area or the or complexity of the piping route, low or high pressure equipment, at 25 and 42 bar respectively, may be chosen, with more values available for the S-FLOW system; up to 60 bar\*.

(\* Refer to the SIEX-HC™ S-FLOW catalogue)



# OUR SYSTEM

SIEX-HC™ 227 equipment is pressurized with nitrogen. This allows the agent to be stored in liquid phase and safely stabilized over a wide range of outside variables (temperature, handling, humidity, etc.), ready to operate at all times.

REDUCED COSTS THANKS TO  
THE USE OF CONVENTIONAL  
COMPONENTS

WIDE RANGE OF PROTECTED  
HAZARDS



## SIEX-HC™ 227 25 BAR

### CYLINDERS CAPACITY (L)

6.7	13.4	25	41	61	84	101
127	150	180	240	368	451	514

\* 2 and 4.7 litre bottles are available in SIEX SMS

### CYLINDERS CAPACITY (lb)

15	30	55	95	140	195	235
290	345	415	555	850	1040	1185

\* 5 y 11.9 lbs bottles are available in SIEX SMS

## SIEX-HC™ 227 42 BAR

### CYLINDERS CAPACITY (L)

6,7	13.4	26.8	40.2	67	80	100	120	180
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\* 2 and 4.7 litre bottles are available in SIEX SMS

### CYLINDERS CAPACITY (lb)

17	34	65	100	170	200	250	300	455
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\* 5 y 11.9 lbs bottles are available in SIEX SMS

The 42 bar option makes it possible to use lower pipe diameters as the cylinders may be located further away.

## CYLINDER VALVES

The RGS-MAM valves and high flow, quick opening valves which produce an effective discharge and facilitate refilling and maintenance tasks. They are made of brass and include a pressure gauge and rupture discs.

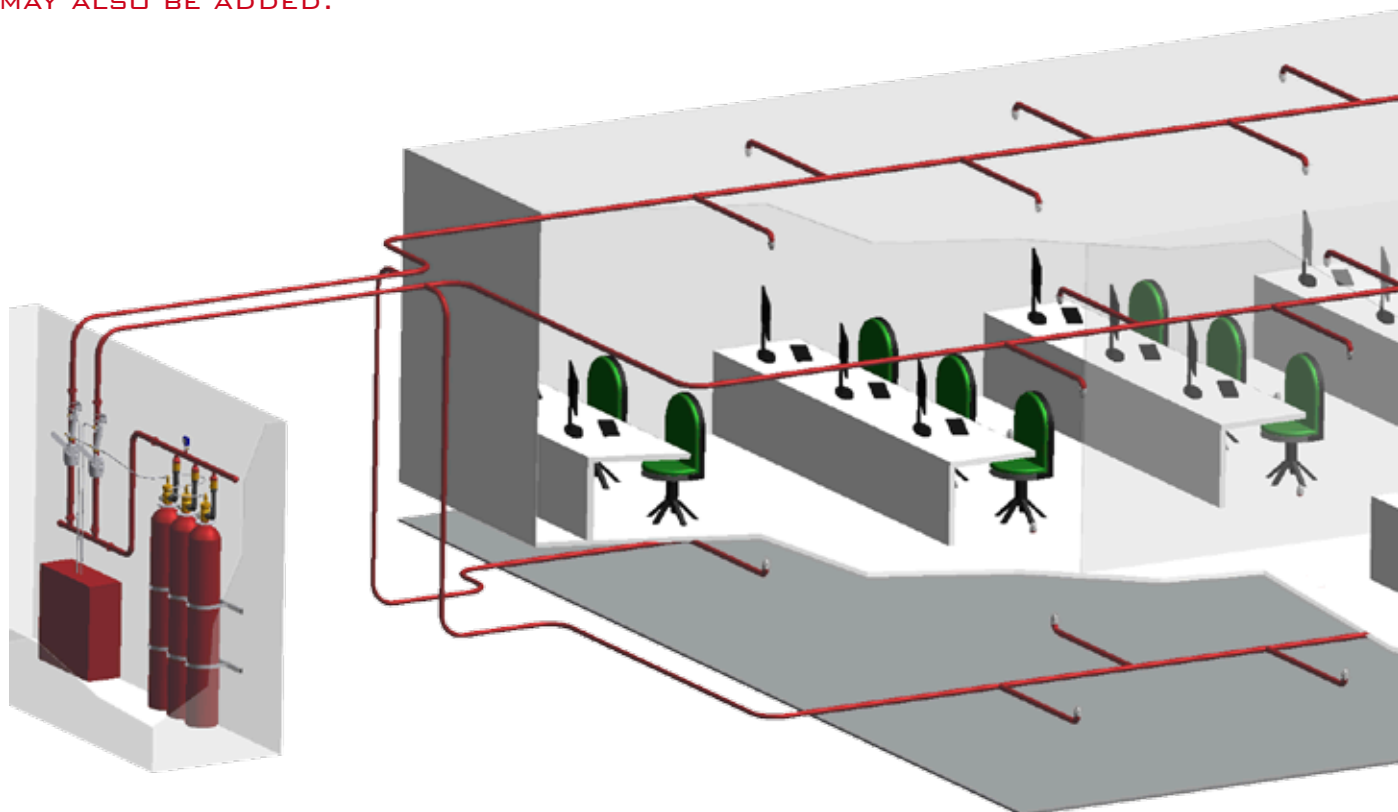
It is VdS certified. The valve assembly, cylinder, burst disc and protection devices are VdS certified and have CE and n marking. It is also FM and UL approval.

## SHUT-OFF VALVES

### WITH AN ELECTRIC SIGNAL

Maintenance can be carried out on the cylinders without accidental activation. They are manually activated and include a limit switch for remote notification of status changes.

**WE OFFER A WIDE RANGE OF ACTIVATION DEVICES, INCLUDING ELECTRICAL, PYROTECHNIC, MANUAL, PNEUMATIC OR MANUAL PNEUMATIC. A MECHANICAL REMOTE MANUAL ACTIVATION PULL STATION MAY ALSO BE ADDED.**



## SELECTOR VALVES

When there are two or more independent hazards together, they can be protected with a single set of storage cylinders thanks to the use of directional valves. The cylinder bank sized for the most unfavourable hazard is sufficient for protecting the rest of them. This translates into a huge installation savings.

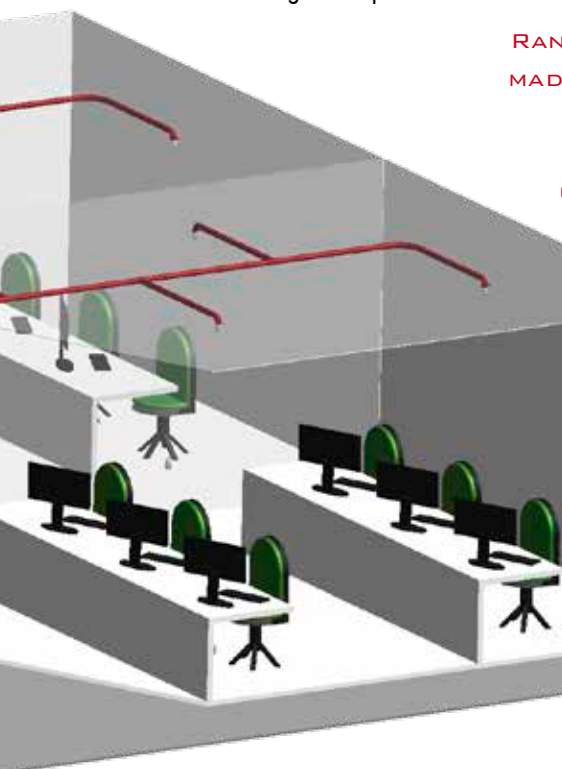
## NOZZLES

To distribute the extinguishing gas evenly in the protected volume. The SIEX FEDR model is used for total flooding of the room, positioned vertically to cover 360° (centered) or 180° (near the wall).

The hydraulic calculation determines its size, ensuring the correct pressure and right amount of agent based on the calibration of orifice plates and the complete calculation of the pipework.

Available in sizes from 3/8" to 2 1/2", manufactured in various corrosion resistant materials.

They have a maximum coverage (13.2 x 13.2) and can be installed at a height of up to 7.1 m.



RANGE OF NOZZLES  
MADE OF STAINLESS  
STEEL, BRASS,  
ALUMINIUM OR  
CHROME-PLATED  
STEEL.

## CHECKING THE AGENT FILL

### CONTINUOUS WEIGHING

The fire panel is alerted of any loss in cylinder fill.

The system is **approved**, simple, easy to install and also allows for visual inspection. It does not remain in contact with the agent, so there is no risk of leakage.

### PRESSURE SWITCH

A pressure switch can be assembled on the SIEX-HC™ 227 cylinder valve, and can be manipulated with the cylinder under pressure. This device monitors the internal pressure, alerting the fire alarm panel of any anomaly.

### PRESSURE GAUGE WITH ELECTRICAL CONTACTS

This combination of pressure gauge and pressure switch makes it possible to check the pressure visually and also sends a warning to the fire panel in the event of any change in the cylinders.

To check the correct activation SIEX-HC™ 227 features:

#### PRESSURE SWITCH

Installed in the cylinder bank manifold or in the piping system, for confirmation of discharge.

## SAFETY DEVICES

Other components may be added to the system to increase the safety of personnel in the discharge areas:

**PNEUMATIC DELAYS, PNEUMATIC SIRENS, RELIEF VALVES, DECOMPRESSION VALVES, INLINE CHECK VALVES AND ODORIZERS.**

For the petrochemical industry, SIEX-HC™ 227 features EXPLOSION-PROOF components.

# FM-200®

FM-200® is a clean agent (heptafluoropropane): colourless, odourless, non-conductor of electricity and producing no residue) which is gaseous under normal conditions, ensuring efficient dispersion and extinguishing effectiveness, with no liquid discharge losses.

It is stored as a liquefied gas under pressure, so, comparatively, the installation requires fewer cylinders and is smaller and more cost effective than with other agents. It also has a high efficiency in weight and volume: according to tests by UL and FM for Dupont®, a concentration of 5.8% of FM-200® achieved extinguishment without reignition of a Class A fire (when the required minimum according to the standard is 7.0 or 7.9%)

In another test the effectiveness of FM-200 was compared with a sprinkler system, and concluded that in the former case the fire was completely extinguished after 125 seconds, 17 seconds after activation; whereas with sprinklers it took up to 273 seconds and 178 minutes later, there was still controlled burning, with serious damage from flooding and soot.



*Suitable for occupied areas*

*Harmless to the ozone layer*

*Electrically non-conductive*

*Clean, leaves no residue*

*High extinguishing capability*

## PRODUCT NAME

TRADENAME	FM-200™
GENERIC NAME	HFC-227ea
CHEMICAL FORMULA	CF <sub>3</sub> CHFCF <sub>3</sub>



## PHYSICAL PROPERTIES

MOLECULAR WEIGHT	170.03
BOILING POINT AT 1 bar	-16.36°C
FREEZING POINT	-131°C
CRITICAL TEMPERATURE	101.7°C
CRITICAL PRESSURE	2.91 Mpa
CRITICAL VOLUME	1.61 L/kg
CRITICAL DENSITY	0.621 kg/L
COMPRESSION CAPACITY	0.255
THERMAL CONDUCTIVITY (LIQUID)	0.069 W/m K at 25°C
THERMAL CONDUCTIVITY (VAPOUR)	0.0126 W/m K at 25°C
SURFACE TENSION	7.00 mN/m at 25°C

## PERCENTAGE EXTINGUISHMENT (at 20 °C)

STANDARDS AND REGULATIONS		NFPA 2001	ISO 14.520
CLASS A	%	6.7	7.9
	Kg/m <sup>3</sup>	0.524	0.625
CLASS B	%	8.7	9.0
	Kg/m <sup>3</sup>	0,695	0.721
CLASS C / HIGHER HAZARD CLASS A	%	7.0	8.5
	Kg/m <sup>3</sup>	0.549	0.677

## DISCHARGE

It acts by total flooding, with the goal of extinguishing the fire in its early stages thanks to early detection. The enclosure must therefore be airtight, and retain the concentration for the stipulated time to prevent reignition.

Discharge is omnidirectional and disperses throughout the space, or around complex structures, which, together with the fact it leaves no residue, ensures total extinguishment with minimal impact on the room and the activity performed on it. It is highly recommended for the protection of valuable assets since it minimizes damage (both due to thermal effects and to burning of products).

Discharge is very safe for potential occupants: in the usual concentrations it is non-toxic and is not metabolized (it is even used as a pharmaceutical propellant), it does not make much noise and does not affect visibility, thus facilitating evacuation.

# APPLICATIONS



*Museums and  
art galleries*



*Telecommunication  
systems*



*Hospitals*



*Petrochemical  
facilities*



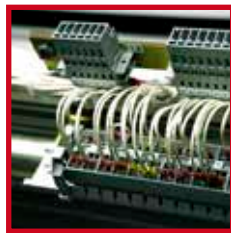
*Computer  
rooms*



*Archives  
and libraries*



*Laboratories*



*Electrical cabinets  
and substations*



*Clean  
Rooms*



*Maritime  
sector hazards*



*False floors  
and false ceilings*



*DPCS*

*...and many other applications*

# ADVANTAGES THAT MAKE IT A UNIQUE

## EXTINGUISHING AGENT

- Low design concentration and **the best performance** by both mass and volume.
- **High extinguishing power and speed**, to prevent fire growth and spread.
- **Minimizes damage and prevents reignition** due to high dispersion in all directions.

## RESUMPTION OF ACTIVITY

- **Immediate resumption** of activity, no cleaning need and no damage to documents or assets.
- Chemically and electrically neutral: **produces no corrosive components** or residue which could damage the plant or equipment protected.

## DURING MAINTENANCE

- **Very stable behaviour** while stored and during discharge. FM-200® agent which is not used for a long time does not suffer diminished performance.
- SIEX offers inspection services, supplies spare parts and provides mandatory periodic inspections.

## FOR THE AGENTS INVOLVED

### INSTALLER:

- Simple low pressure system. Compact and manageable systems.
- Reduced wall thicknesses and weights.
- More cost-effective equipment.
- Comprehensive advice at every stage of the project.

### USER:

- Safe evacuation, does not reduce oxygen levels or cause a temperature drop.
- Good visibility.
- Lower overpressures.
- Non-toxic, not metabolized.
- Low noise discharges.

### FINAL CUSTOMER:

- Small equipment, smaller footprint.
- Adaptable to each requirement: can be configured for various working pressures, wide range of control components, safety, and in various sizes.
- SIEX quality and safety guarantee with international certification.

## **SIEX**

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