



MX 200 fire extinguishing system
with the extinguishing agent HFC-227ea

Safe for certain.

MINIMAX

EFFICIENT +

FAST AND SMOOTH

Lost data, the breakdown of machines and equipment, on which enterprise-critical business processes are proceeded, or a total breakdown of operations – those are risks, which represent a concrete existential threat for every company. Companies with unique and high-value technical equipment and central IT systems are dependent on the high availability of these critical operating resources. This is inevitably leading to growing expectations concerning fire protection.

Here fire extinguishing systems are in demand, which detect a developing fire in its initial stage and extinguish it in an exceptionally fast and protective manner so that even sensitive components are not damaged e. g. by residues of extinguishing agent. This is why Minimax has developed the MX 200 fire extinguishing system with the fire extinguishing agent HFC-227ea. It is characterised by its highly effective and fast extinguishing action (< 10 seconds). The extinguishing agent itself is toxicologically harmless; it extinguishes without leaving any residue and gets along with a small storage volume. The extinguishing agent acts both physically and chemically.

Extinguishing agent approved throughout the world

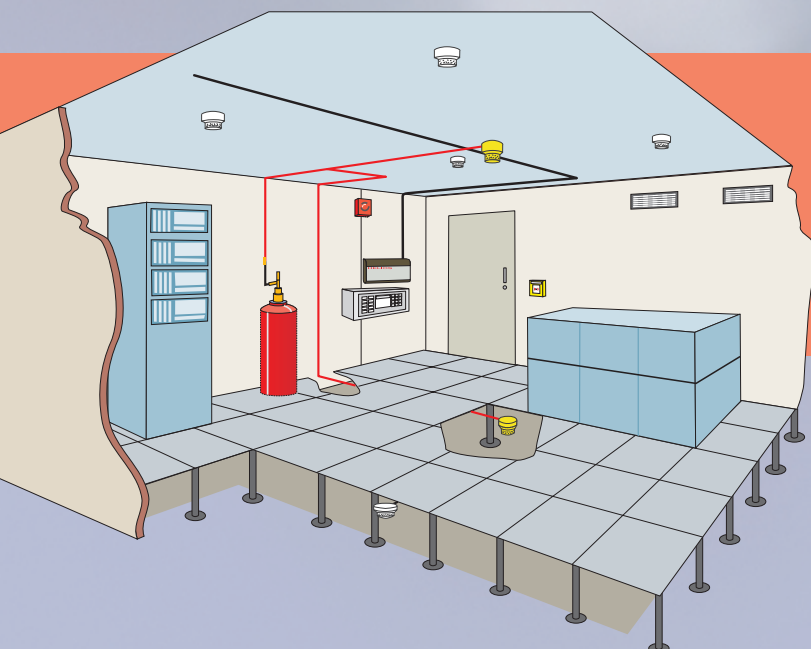
The fire extinguishing agent treated in the ISO 14520-9 under the designation HFC-227ea is widely used throughout the world. Thanks to its environmental properties and good price/performance ratio it has become established in many countries as the extin-

guishing agent for manageable IT and electrical risks. In Europe its use is regulated by the F-Gases Directive (Regulation (EU) No. 842/2006 on certain fluorinated greenhouse gases).

The MX 200 fire extinguishing system can be individually adapted to suit nearly every area. Nozzle holes and container fill volumes are the result of object-specific design calculations and characterise a system optimised down to the smallest detail. The charging pressures of up to 50 bar mean that multi-zone systems and longer pipeworks can be designed. No separate space is needed for the supply of extinguishing agent, it can be located in the protected area itself.

Mode of operation

When a starting fire is detected by one of the automatic fire detectors or when a push button is activated, the fire detection control panel sets off a fire alarm. After a object-related delay time the pressurised extinguishing agent cylinders are opened either electrically or pneumatically. The extinguishing agent, still liquid at this point, flows to the extinguishing nozzles where it vaporises and rapidly and effectively floods the room.



MX 200 fire extinguishing systems –
efficient fire protection for electrical and
electronic installations

EXTINGUISHES WITHOUT LEAVING ANY RESIDUE

The extinguishing agent HFC-227ea

HFC-227ea is suitable for class A and class B fire and is used as total flooding agent. The gas pressure of 3.91 bar at 20 °C favours a rapid vaporisation at the nozzles and speedy distribution throughout the room. HFC-227ea is neither corrosive nor electrically conductive and therefore causes no damage through short circuits or through residues left on sensitive components. It is colourless and almost odourless and is in gaseous form at room temperature. Its molecules consist of carbon, fluorine and hydrogen. HFC-227ea deprives the flames of heat, thus interrupting the combustion reaction.

| HFC-227ea | |
|--------------------------|---|
| Chemical formula | CF ₃ -CHF-CF ₃ |
| Chemical name | Heptafluoropropane |
| ISO designation | HFC-227ea |
| Specific weight (20 °C) | 1.41 kg/l |
| State of aggregation | gaseous (at 20 °C/1.013 bar) |
| Boiling point | -16.5 °C (at 1.013 bar) |
| Environmental properties | No ozone depletion potential (ODP 0) global warming potential (GWP 3500) |

Safety of persons

Due to its worldwide use HFC-227ea has become one of the most studied synthetic extinguishing agents so that has been assessed as safe for use in rooms where persons are present. The design concentration for IT rooms is between 7.9 and 8.5 % and thus lies below the NOAEL value.

Safety factor at the design concentration

- ▶ NOAEL 9 % by volume
(no observed adverse effect level)
The highest extinguishing gas concentration in % by vol., at which no detriments to health have been observed.
- ▶ LOAEL 10.5 % by volume
(lowest observed adverse effect level)
The lowest extinguishing gas concentration in % by vol., at which detriments to health have been observed.



ADVANTAGES

MX 200 FIRE EXTINGUISHING SYSTEM

- ▶ Excellent price/performance ratio
- ▶ Robust design, so low maintenance costs
- ▶ Rapid extinguishing effect
- ▶ Safe for use in occupied areas
- ▶ No extinguishing agent residues, neither corrosive nor electrically conductive
- ▶ Simple design and hydraulic calculation by using professional MX 200 software
- ▶ Higher operating pressure possible than comparable systems, so
 - longer pipeworks and
 - multi-zone systems can be achieved
- ▶ Compact and space-saving
- ▶ VdS approved, CE marked
- ▶ Worldwide recognised and approved extinguishing agent



Example of a multi-cylinder system

What you're looking for: system types from A to Z

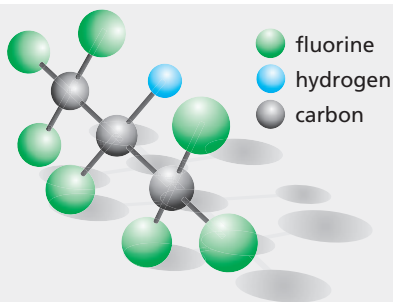
- ▶ Available cylinder sizes:
22, 25, 40, 50, 80, 100, 140, 180 litres
- ▶ Pressure stages available: 25, 42, 50 bar
- ▶ Single- or multi-cylinder systems
- ▶ Single- or multi-zone systems

Example of use EDP

| Design concentration* | Minimum usage quantity |
|-----------------------|----------------------------|
| 7.9 % by volume | 62.5 kg/100 m ³ |

*(ISO 14520-9) / EN 15004-5 (draft)

HFC-227ea molecule



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