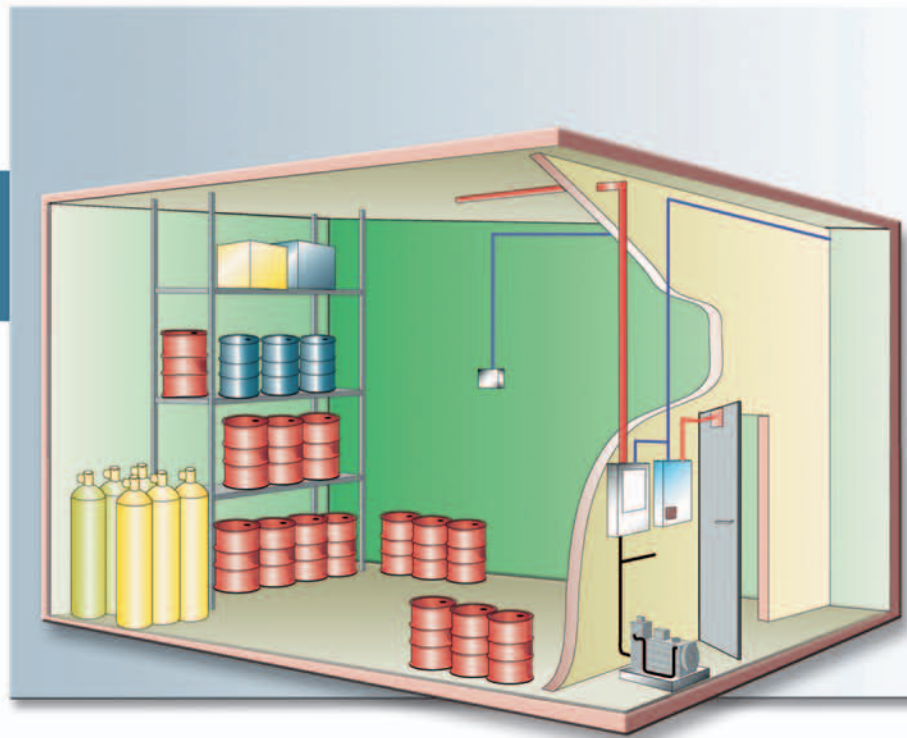


PermaSafe[®]

The innovative
fire suppression system

PermaSafe

The innovative fire suppression system



Principle of operation

The development of a fire requires three characteristic components:

1. combustible material
2. heat
3. oxygen

The avoidance of ignition sources is not always possible in practice, nor the removal of all combustible material.

The Kidde PermaSafe system therefore works by influencing the oxygen component.

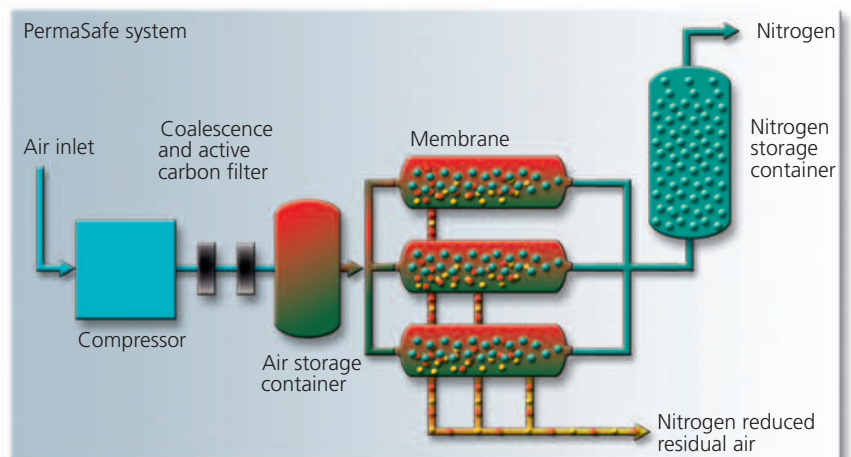
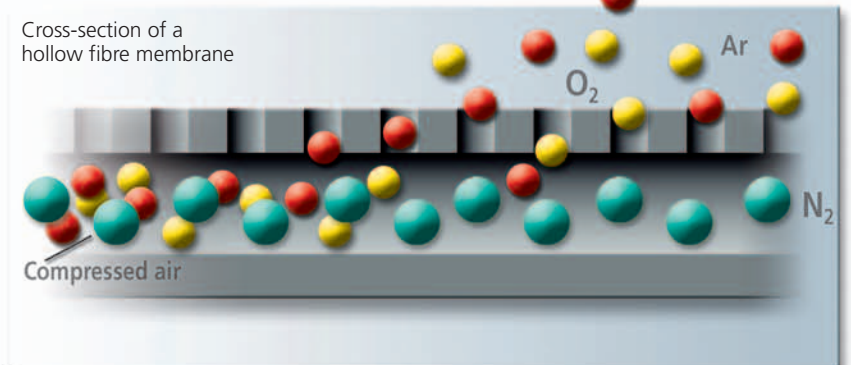
The PermaSafe system is an innovative fire suppression system. By the controlled lowering of the oxygen content in a closed room it creates an atmosphere in which the development of a fire is impossible. The lowering of the oxygen content in a room is achieved with nitrogen produced from compressed air. The principle of oxygen displacement is similar to that of an inert gas extinguishing system.

These rooms can still be frequented but, they are not suitable for use as permanent work spaces because the mental and physical performance ability is restricted.

The propagation of a fire of solid combustibles is prevented, with minor exceptions, at a residual oxygen content between 13 and 15 % by volume.

Even a lighter cannot be lit in this atmosphere but, it is possible to perform non-strenuous work for longer periods under these conditions.

For fully automated and not frequented stores a controlling range of the residual oxygen content between 12 and 13 % by volume is recommended. In this atmosphere the ignition of solid or liquid combustibles is prevented.



| Height above NN (sea level) | Endangering of people | Fire risk | Oxygen concentration (related to NN) |
|-----------------------------|-----------------------|-------------------------|--------------------------------------|
| 8000 m | | | 8 Vol. % |
| 7000 m | | | 10 Vol. % |
| 6000 m | ↑ Endangering | | 12 Vol. % |
| 5000 m | ↑ | | 15 Vol. % |
| 4000 m | ↑ | ↑ Excluded | |
| 3000 m | ↑ Impairing | ↑ decisively reduced | 21 Vol. % |
| 2000 m | ↑ | ↑ | |
| 1000 m | | | |
| 0 m | | | 21 Vol. % |

Residual oxygen supervision

The residual oxygen concentration in a closed room is redundantly controlled via two lines. The range of inertness is permanently supervised by this.

The signals of the gas detectors are processed by evaluating modules. Those modules are installed in the central supervision and control panel and have threshold relays at their disposal as well as a digital display showing the prevailing concentration. In case of a fault an alarm signal will be generated.

The product concentration of the membrane system is also checked and shown for adjustment.



Typical applications

Only relatively gas-tight rooms which are not regularly frequented by people are suitable for the PermaSafe system.

- cold stores
- EDP rooms
- hazardous goods stores
- archives
- treasure rooms
- telecommunication systems
- show cases in museums
- silo bins
- mixers

Objects which are not suitable

Rooms with a high rate of fresh air intake and rooms where people are permanently present are unsuitable for a PermaSafe system.

- conditioned rooms with fresh air intake
- rooms frequented by public
- rooms with large openings to the open air
- rooms built from diffusible materials

Clients advantages

- No development of fire possible
At an oxygen concentration of 12 % by volume no materials will burn, with the exception of explosive materials and dusts
- Best protection for valuable goods
- No pressure relief necessary
- No removal of contaminated extinguishing agent
- High safety for people
- Economical and space saving concept, especially if a supply of sufficient compressed air is already available
- No pipe network for nozzles
- Reduced staining due to oxidation such as rust and decomposition because of the oxygen reduced atmosphere



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Subject to changes!

The information in this brochure are only general descriptions and/or performance data which, as described herein, are not always applicable to the specific case of application and/or which can be changed due to further development of the products. The performance data desired will only then have binding character if they are agreed expressly at contract conclusion.

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