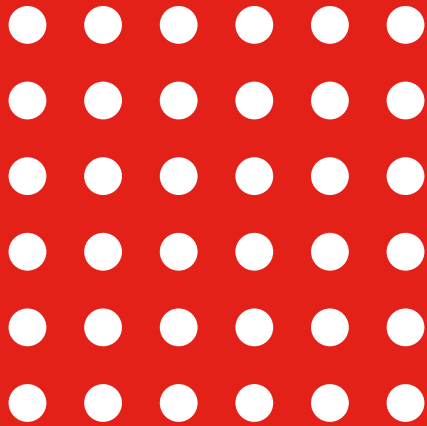




Fire Prevention Systems



A Revolution in Fire Safety

FirePASS® is a revolutionary fire prevention technology. It has the unique ability to create a breathable oxygen-reduced (hypoxic) environment which prevents flame ignition and, at the same time, is safe and healthy for human occupants. The FirePASS® technology guarantees:

Unmatched fire safety

FirePASS® prevents fire proactively instead of suppressing it after it has started and damage has already occurred.

Absolute safety for human beings

FirePASS® produces and uses breathable air for fire prevention – thus avoiding any hazard to human occupants and any damage to the prevented rooms and their content.

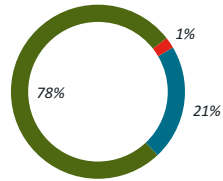
Environmental friendliness

FirePASS® uses natural, ambient air as its resource – no chemicals, no gases or similar are involved. The FirePASS® agent is simply hypoxic (oxygen-reduced) air. Nothing is added.

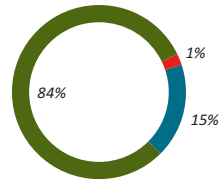
The revolutionary concept of FirePASS® technology and its various applications are protected by patents worldwide. The FirePASS® group is the only legal manufacturer and vendor of systems providing breathable fire-prevention environments.

Why be reactive when you can be proactive?!

The FirePASS® approach



normal Atmosphere
(at all altitudes)



FirePass Prevention
Environment

Hypoxic air is produced by partly filtering out oxygen from ambient atmospheric air. Normal atmosphere always contains 20.9 % of oxygen. By ventilating a room with this oxygenreduced air a hypoxic fire prevention environment is established. Typically, such a FirePASS® prevention environment will contain 15 % oxygen which is perfectly suitable for human life but is not sufficient to support combustion. The respective partial pressure of oxygen corresponds to an altitude of around 2 700 m or 9 000 ft.

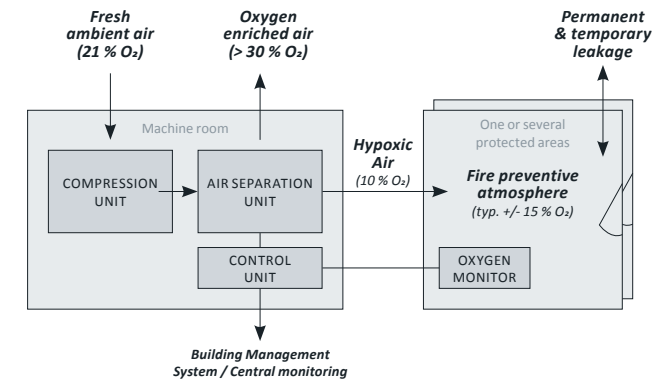
■ Oxygen ■ Nitrogen ■ Other

Safe working conditions

Most common flammable solid materials and liquids cannot be ignited in environments with an oxygen level lower than 16%. However, humans easily tolerate an oxygen-reduced atmosphere of 14–16% O₂ without any health hazards (instead of 20.9% O₂ as in natural, ambient air). Anybody traveling on a modern passenger airplane has experienced oxygen concentrations corresponding to around 15% of oxygen at sea level. In addition, millions of residents live in altitudes of 3 500m / 11 000ft and above (corresponding to less than 14% of oxygen at sea level), such as in La Paz, Bolivia, without showing any impairment of their physiological functions. Scientific research has proven that working in such hypoxic conditions does not impose any health hazards on healthy human beings.

Configuration of FirePASS® systems

A schematic view on the standard configuration of FirePASS® hypoxic air venting systems:



How FirePASS® works

- Ambient air is drawn into the hypoxic generator where it is purified and turned hypoxic.
- The air ventilates the entire room, inhibiting any common fire ignition.
- Hypoxic air leaks from the room, thus completing the flow and ventilating the facility.
- A control unit monitoring the room with oxygen-sensors permanently ensures a stable hypoxic environment in the room.

FirePASS® uses natural, ambient air as its agent to prevent fire

Custom Fit Technology

FirePASS® offers a large variety of hypoxic air venting systems that can fit any application. They range from self contained units for smaller volumes to big systems for huge buildings. FirePASS® systems can protect single or multiple rooms and compartments with volumes of up to several 100 000 m³/mil. cft and even more. Two examples:

Hypoxic Air Generator Unit



FP-8000 Twin System



Characteristics of FirePASS® systems

FirePASS® hypoxic air venting systems will be designed, engineered and manufactured to the requirements and specifications of our customers. FirePASS® systems are guaranteed to offer the following features:

- Every system is equipped with a touch panel control unit, which can be located remotely and is able to communicate with Building Management Systems.
- O₂-room monitoring units are provided in the required number.
- An inbuilt battery assures the function of the control and alarm system even in the case of general power failure.
- The compression units are equipped with highly reliable compressors, refrigerant dryers, separate condensate cleaners and buffer vessels.
- Each hypoxic air generator unit has a 3-stage pre-filtering and a moisture alarm.
- 3-phase 400v and 50Hz power supply (other voltages and frequencies on request).
- Every system is fully mounted and tested.
- The layout and skid size of the system may be adjusted to specific requirements and size of the particular location.
- All systems can be configured as Twin-Systems, offering full redundancy of compression and generator units to improve failure safety.

Typical Applications

FirePASS® achieves the ultimate goal in fire protection: Fire prevention. While all other systems only react when fire and damage is already occurring, FirePASS® is proactive and still allows access and permanent occupation of the fire-prevented room at all times.

In any situation in which the highest level of fire protection is essential, FirePASS® is the first choice. Amongst many other applications this applies for high value technical installations like servers, telecommunications and control rooms where uninterrupted operation is a must, for example, or for irreplaceable items such as museum exhibits and archived documents and for valuable goods on store.

IT and Telecom rooms, Data Centers etc.



Any damage to equipment or interruption of operation immediately causes huge costs and incidental damages.



FirePASS® systems completely eliminate any risk of data losses and system down times caused by fire.



Storages

FirePASS® eliminates the risk of having damage caused to delicate goods and food by fire, smoke or extinguishing agents.



FirePASS® is perfect for cool storages: It is easy to install and delivers continuous protection even at very low temperatures – without any risk of freezing water-pipes, valves or nozzles.



A change of use in the protected area doesn't create any need for changes to the FirePASS® installation.

Control rooms in power plants, industrial production and similar areas



Control rooms typically contain the core steering elements of complex activities. Any loss of control may cause immense costs, damages and, in some cases even hazard to many human beings. Even a brief black-out is intolerable.



FirePASS® assures continuous operation and allows permanent access and occupation without interruption thus avoiding any loss of control.



Museums and Archives

Documents, historic artifacts, paintings, etc. are all irreplaceable goods of high real or ideational value. They are destroyed or strongly damaged by fire, water, smoke and chemicals.



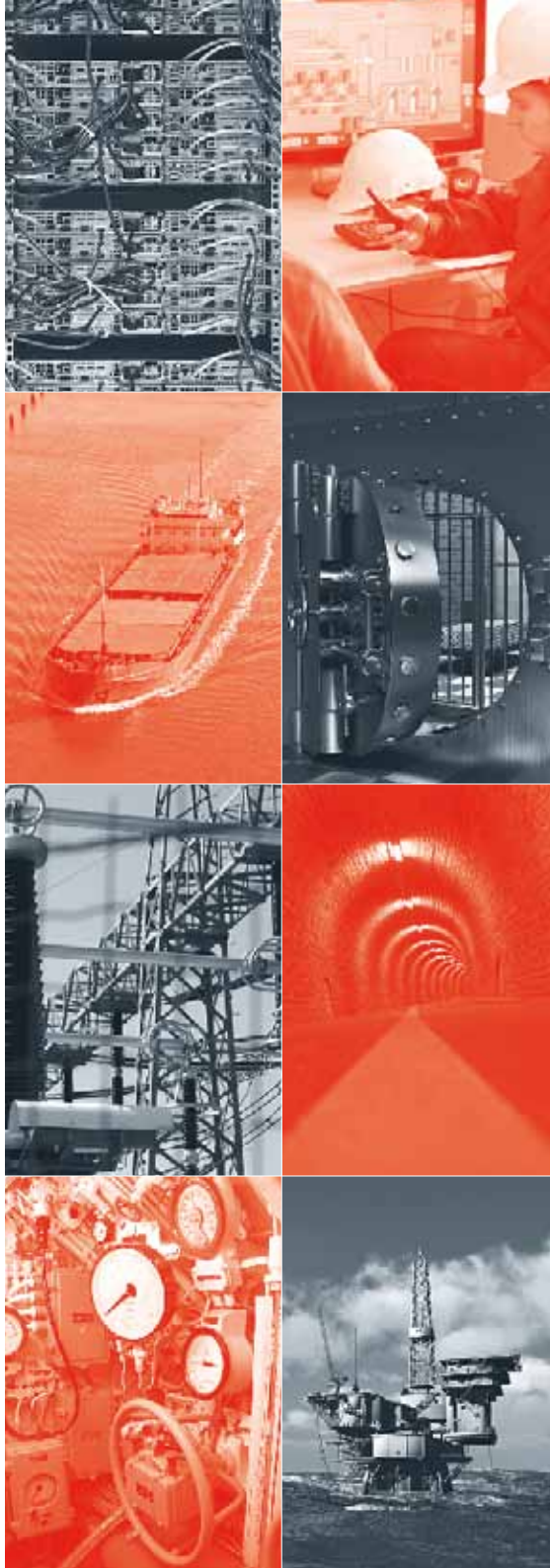
FirePASS® not only prevents the outbreak of any fire and avoids collateral damage by extinguishing agents, but also reduces deterioration due to the reduced oxygen content of the hypoxic air produced.



Further FirePASS® applications

- *Electrical switching and battery rooms*
- *Confined spaces on ships*
- *Offshore platforms*
- *Safe vaults*
- *Libraries*
- *Ammunition bunkers*
- *Cable tunnels*
- *and many, many more.*

FirePASS® not only prevents the damage of goods and equipment but also annihilates environmental risks and collateral damages of fire and fire extinguishing systems.



Implementing FirePASS® systems

FirePASS® is easily installed in already existing premises as well as in newly built spaces. When planning for a FirePASS® system the following should be known:

- FirePASS® systems consume little space compared to conventional systems and don't need any distribution piping within the protected spaces. The only requirement is simple, zero-pressure piping to each protected area and to the ambient air outside as well as wiring of the oxygen monitoring units in the protected areas.
- The protected areas should be equipped with highly sensitive smoke detectors.
- A comfortable, breathable atmosphere is created inside the confined spaces by the constant ventilation with fresh hypoxic air.
- The highly reliable hypoxic air generators need very little maintenance – a cycle of 6 months is typical.
- FirePASS® systems can be used as an alternative, but also as a complementary or supplementary option which enhances the conventional fire-safety means without interfering with their performance.
- Note: The protected areas have to be confined spaces that are well sealed in order to minimize the permanent leakage of air in and out of the room. All spaces included in the fire prevention must have split-type air cooling or closed, dedicated air recirculation systems.

1. Certainty of avoiding the outbreak and spread of fire

2. Retaining access to protected areas at any time

3. Proactive and permanent fire protection to secure business processes and valuable goods

4. Protecting multiple hazards with just one system

5. Fire protection without any interruption – no refilling or replacement needed

6. Absolute safety for human beings through using breathable air as the agent – no nitrogen-injection

7. Environmentally friendly – no chemicals used

8. Scalable to any size of protected areas and number of compartments – no design limitations

9. Very small foot-print and little building space needed

10. Easy to install and maintain

Advantages of FirePASS[®] systems

11. No excessive piping, no nozzles, no pressurized cylinders or pipes, no leaking, no expensive refilling

12. No damages by fire, released water, foam or other extinguishing agents, no false discharges, no discharge failures

13. No loss of work time through activated fire alarm systems, no disruption of working processes, no consequential costs

14. No closing of unusable areas due to fire damages, clean-up or repair

History of FirePASS®

2011

FirePASS® has a large and constantly growing network of partners ensuring local presence and quick service response. Currently FirePASS® partners offer consulting, sales, maintenance, repair and customer support in more than 60 countries worldwide.

2010

FirePASS International AG is founded to market FirePASS® technology worldwide having its main office in St. Gallen, Switzerland, and additional production centers located in Netherlands and the United States of America.

2009

Boeing Company and Honeywell International obtain a license from FirePASS® for the use of its technology in airplanes.

2008

First commercial installations of FirePASS® systems are realized in Norway, Spain and the USA.

2007

The United States Federal Aviation Administration (FAA) adopted FirePASS® technology for protecting fuel tanks on all commercial airplanes.

2006

The inventor Igor Kotlyar receives the first registrations for his patents regarding FirePASS® technology and its applications.



»The revolutionary FirePASS® hypoxic air technology is the first and best choice for fire protection in any enclosed space. The unique approach of using breathable air guarantees unmatched fire safety and absolute safety for human beings at the same time.«

A handwritten signature in red ink, appearing to read 'L. Allgoewer', written in a cursive style.

Ludwig W. Allgoewer
President & CEO

FirePASS[®]

Fire Prevention and Suppression Systems

FirePASS International AG

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