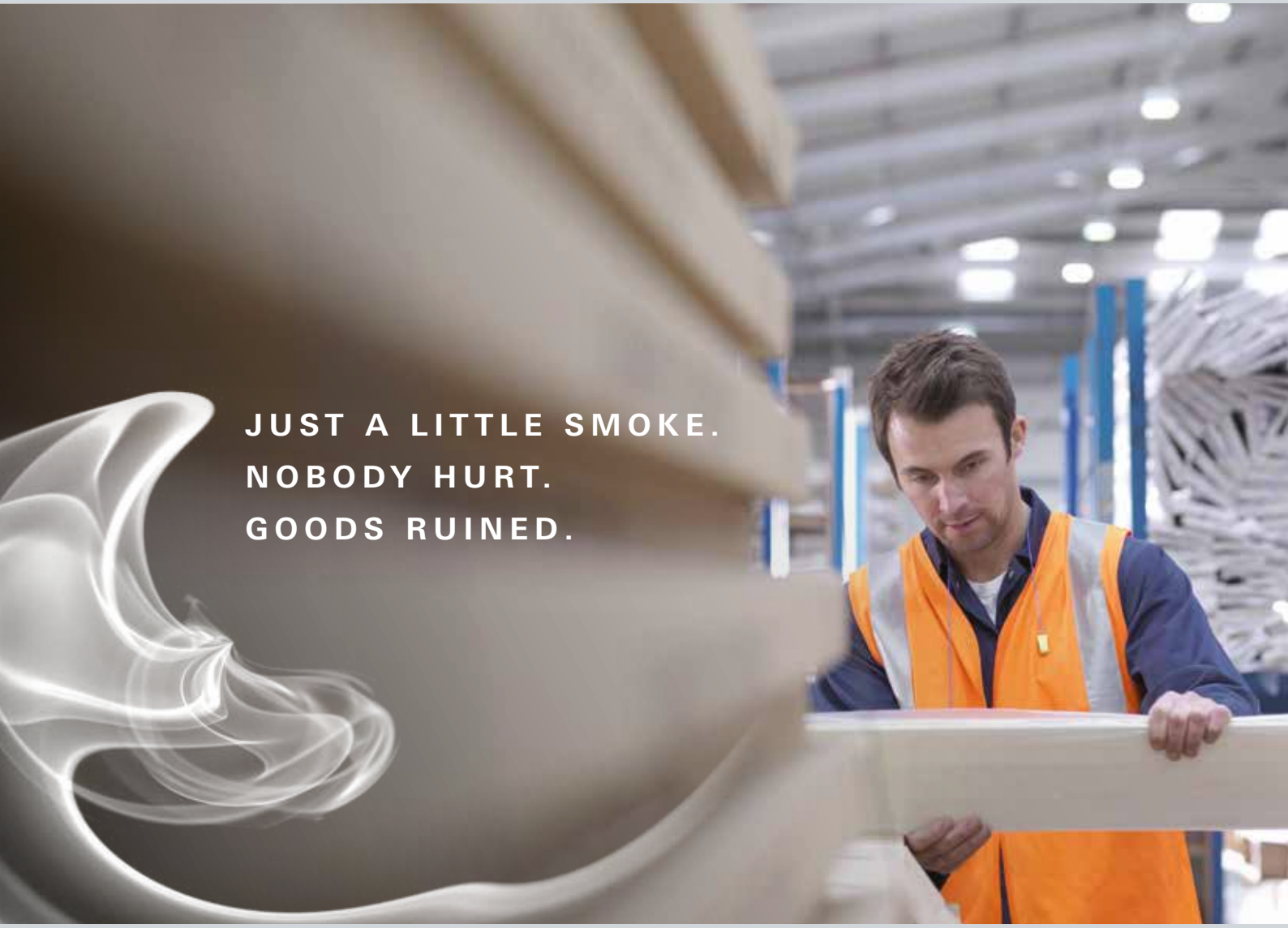
EVERYTHING IN STOCK. BUT ONE QUESTION REMAINS: HOW SAFE IS SAFE?

Personalised fire protection solutions for warehouses and logistics

WAGNER®



In warehouses where goods worth millions are stored or deliveries are performed just-in-time, even small fires can cause enormous problems.

Nowadays, goods must be available around the clock – normally just in time. Modern high rack storage areas in large logistics operations are part of the solution. However, the focus on a single logistics site also increases the risk of a complete system stoppage along the entire supply chain in the event of a fire. Stoppages must be avoided at all costs.

Ever higher stock values
Requirements in the logistics sector continue to grow – and with them the height of the high rack storage areas. As a side effect of the higher racks, the increased storage quantities translate to increased stock value, which needs to be protected against fire. Smoke, soot and fire-fighting water can have devastating consequences, which is why even small smouldering fires can cause immense damage.

Serious consequences
Without this protection, the stock is at risk of suffering enormous damage. However, a fire can have even graver consequences than merely the loss of the stored goods or building damage. In times where stocks are deliberately maintained low and deliveries performed just in time, a sudden incapacity to delivery can have extensive repercussions. If the assembly lines are down, interruptions of operations can soon cause millions worth of damage or result in the loss of invaluable customer relations. The employment of optimal fire protection solutions is essential for all of these reasons.

THE DEFECT WENT UNDETECTED.
THEN THE FLAMES CAME.
THEN THE RESTRUCTURING SPECIALISTS.

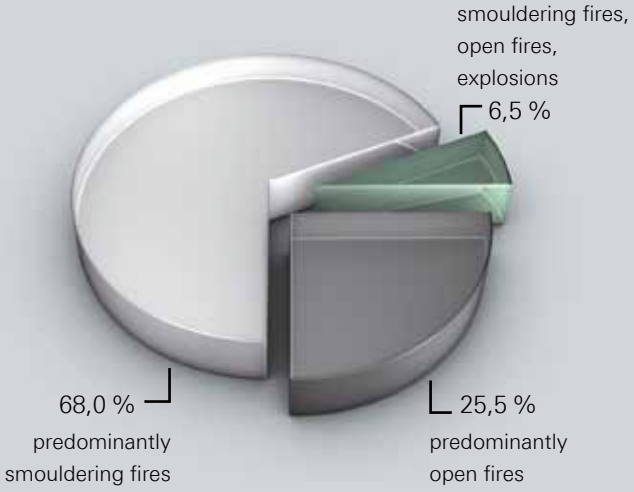
The question on everybody's lips after a fire is always "Just how could this happen?". The answer is usually that there was a lack of efficient fire protection measures in place.

Every month an average of 15 major fires occur in Germany, causing over a million euros worth of damage each. This related to over 1.1 billion euros of insurance claims in 2005 alone. These spectacular major fires could only occur because the fire protection measures in place were either insufficient or non-existent. In addition, the causes of fires can vary considerably, which is what makes personalised fire protection solutions indispensible.

Source: HDI

Cause of fire	Proportion	
Defective electrical equipment and installations	25,5 %	predominantly smouldering fires
Smoking	20,0 %	
Hot surfaces	8,0 %	
Welding and thermal cutting	5,5 %	
Friction	4,5 %	
Spontaneous combustion	3,5 %	
Radiant heat	1,0 %	
	68,0 %	
Sparks and combustion equipment	3,5 %	smouldering fires, open fires, explosions
Chemical reactions	1,0 %	
Electrostatic discharge	1,0 %	
Mechanical sparks	1,0 %	
	6,5 %	
Arson	17,0 %	predominantly open fires
Naked flames	6,5 %	
Molten substances	1,0 %	
Lightning strikes	1,0 %	
	25,5 %	

Distribution of causes of fire by Bussenius



Fire risk of stock

Fires that originate in the stock itself are rare, but not unheard of. For example, hot spots can be brought in from the order picking area, which have developed undetected and only turn into a sudden fire several hours later. Shrink wrap packaging films and pallets or irradiated goods can also cause fires.

The main cause: technical defects

However, the main cause of fires is technical defects in electrical equipment present in almost all warehouses. This includes switch cabinets and control boxes, electrical motors and, in deep freeze storage areas, refrigerators and defrosters. Welding and thermal cutting work used for repairs and maintenance also increases the risk of fire immensely. Depending on the burning material (smouldering capacity, burning behaviour, packaging), it may not be possible to extinguish a fire reliably, even with a specially adapted sprinkler system. There is still the risk of the fire re-igniting, even after several hours. A comprehensive fire protection solution must therefore be tailored to fit the individual requirements of each warehouse.

RISK RECOGNISED.
RISK REMOVED.
OR DIRECTLY SUPPRESSED.

No two warehouses are the same. That's why special circumstances always require a special, personalised fire protection solution.

With their compact designs, height and the stored goods, modern high rack storages offer excellent conditions for a fire to spread quickly. In the worse case scenario, the fire brigade has no chance of fighting the fire. Top priority must therefore be prevention. WAGNER is happy to lend a helping hand: with our tailored solutions, we ensure that fires are detected as quickly as possible or don't even have the chance to spread in the first place.

Ideal fire conditions
High rack storage areas reach heights of over 40 metres. This, together with the small gaps left between the stored goods, provides ideal conditions for a fire to spread. Even goods in higher racks can become heated so quickly by the rising fumes that the flames suddenly spread right up to the roof of the warehouse. This process can take only a few minutes if adequate countermeasures are not in place. Even slight exposure to soot or smoke can contaminate the stored goods and render them unusable.

Every warehouse is different
While plastic containers in miniload warehouses act as little accelerants, the spread of fire in deep freeze storage areas is facilitated by the extremely dry air. Here, where foodstuffs are usually stored, countermeasures with fire-fighting water containing antifreeze have another fatal consequence: they render the entire stock unusable.
Water retention basins must be specially established, as the fire-fighting water can otherwise contaminate groundwater and wastewater.

The risk of a fire
A fire can cause total loss and environmental damage if no countermeasures are in place. The risk of falling parts, restricted access routes and severely restricted fire extinguishing possibilities in the interior as a result of the warehouse height and storage density make the situation considerably more difficult in case of fire.

Personalised solutions
Whatever your requirements: here at WAGNER we develop personalised fire protection solutions to ensure that your capacity to delivery is not put at risk by a fire.

DRIVING FORCE.
PLANT CONTRACTORS.
SOLUTION-ORIENTED.

As a technology leader, we set standards with our innovative fire protection concepts.

Dependencies in the warehouse and logistics sectors resulting from interdependent processes render innovative fire protection technologies ever more important. We offer a tailored package from one source. This can include the OxyReduct® fire prevention system, the TITANUS® early fire detection system, the FirExting® fire extinguishing system and fire risk management with Visu*LAN*®. Our range of services stretches from personal support and custom-designed solutions up to the installation and regular inspection of systems.

WAGNER sets standards
With our personalised solutions, we ensure reliable fire protection so that you can perform your deliveries reliably. Our TITANUS® earliest fire detection system detects fires as soon as they appear and is up to 2,000 times more sensitive than conventional smoke detectors. This translates to a decisive time advantage allowing you to implement countermeasures more quickly, for example, triggering a gas extinguishing system to extinguish the fire.

OxyReduct® – it doesn't get any better
With our OxyReduct® innovative fire prevention system, we're going one step further, as OxyReduct® offers a never before attained level of fire protection. The level of oxygen in the air in the room is simply reduced until it falls below the ignition threshold of the stored goods via the addition of nitrogen. This makes it impossible for a fire to spread. Provided that the rules and regulations of the employers' liability insurance association are observed, the accessibility of the warehouse remains unaffected down to an oxygen level of 13 Vol.-%.

Systematic safety
Whatever type of warehouse you operate: our fire prevention solutions systematically ensure optimal safety, as WAGNER represents the current standard in fire protection.

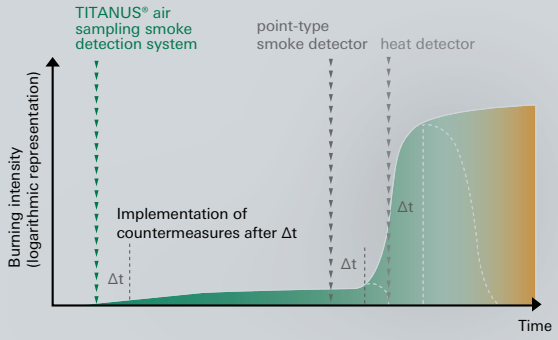
We are your partner when it comes to safeguarding your ability to deliver and protect high rack storage areas, mini-load ware-houses, deep freeze storage areas and hazardous materials stores from the risks and consequences of fire. The applications tailored to your personal requirements by our engineers offer you the highest possible level of fire prevention for your plant, the high-value stock and your corporate success.

STANDARD FIRE DETECTION.
IMMENSE FIRE DAMAGE.
LIVELIHOOD IN DANGER.

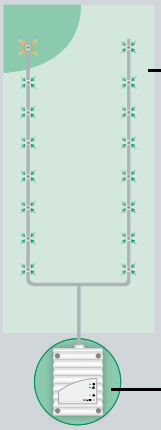
Every second counts where fire is concerned. The TITANUS® technology offers a time advantage which can be decisive for the survival of entire companies.

TITANUS®

Highly sensitive air sampling smoke detection systems in comparison with conventional smoke detectors



Conventional smoke detectors have a major disadvantage: they only respond to a certain smoke concentration or temperature. By that time it is often too late to implement countermeasures. The TITANUS® technology sounds an alarm for emerging fires that haven't even started to burn properly yet. The system is up to 2,000 times more sensitive than conventional systems and immune to false alarms.



Pipe system

- air samples are taken continually from the protected area via sampling vents

Detection unit

- safer and earliest possible detection thanks to High-Power-Light-Source
- the LOGIC·*SENS* intelligent signal processing system detects phenomena that mimic fires and guards against false alarms efficiently

Every second counts

You will be well aware of how valuable seconds and minutes can be if you estimate the value of your warehouse and your customer relations. This is where TITANUS® earliest fire detection comes into its own. It offers an invaluable time advantage when it comes to the protection of people and asset values as it gives you the time to implement countermeasures if a fire is detected and thus avoids the damage caused by fire, fire-fighting water or large quantities of smoke. TITANUS® air sampling smoke detection systems can be used in all storage areas.

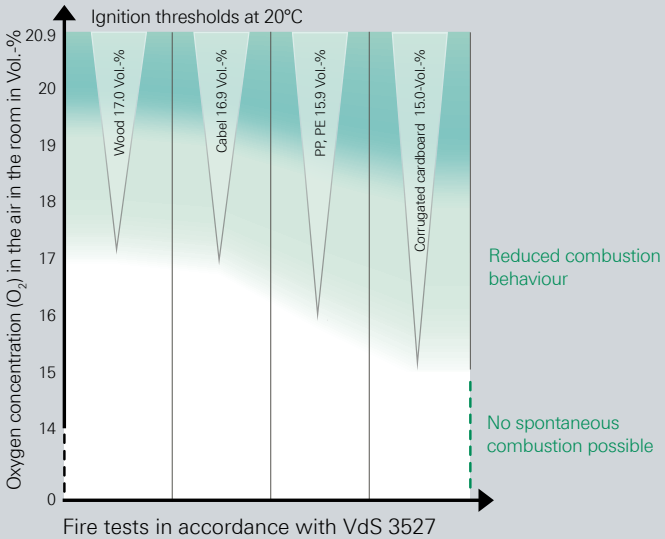
Business as usual

The requisite pipe system can be easily integrated in the racks and installed simply and flexibly. As the detection units are mounted on the front of the racks within easy reach, there is no need to enter the racks for maintenance or servicing work. Additionally, the detection units are largely protected against damage, unlike conventional smoke detectors, which are sometimes mounted directly in the racks and at various heights.

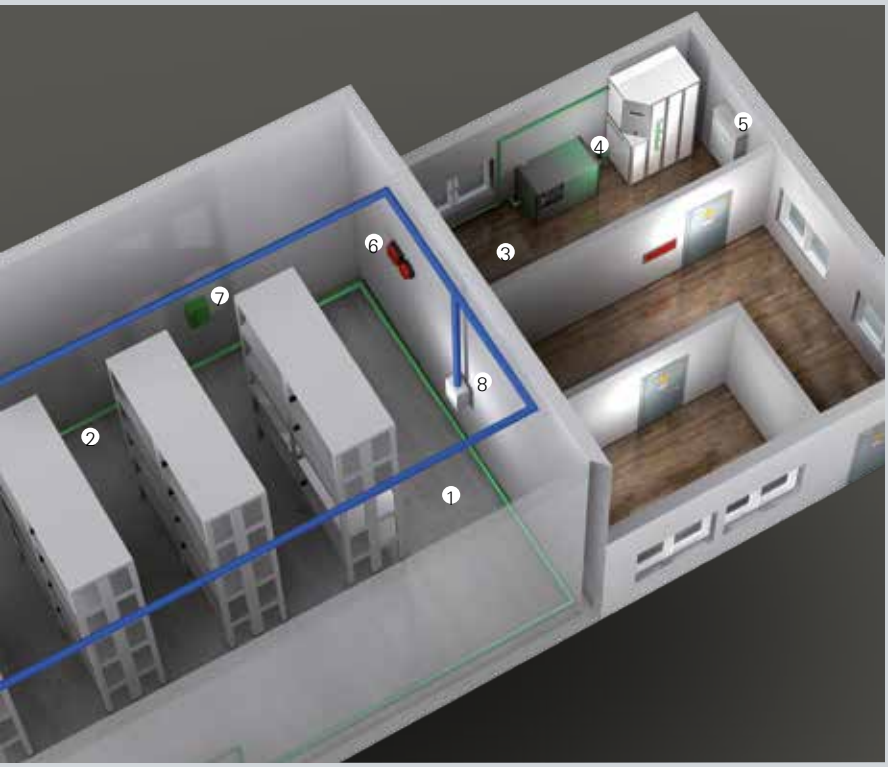
LESS OXYGEN.
MORE NITROGEN.
NO FIRE.

The innovative OxyReduct® fire prevention system doesn't give fire a chance.

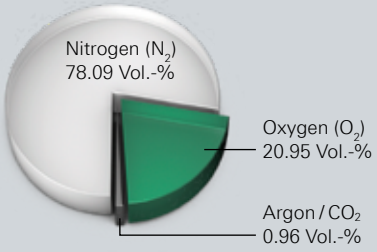
Ignition thresholds for materials in storage areas



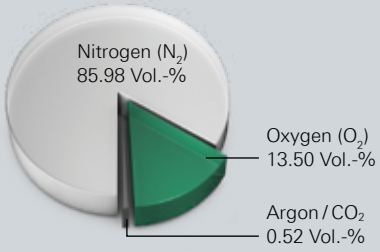
Detecting fires as early as possible is one thing, but what if the countermeasures do just as much damage to the stored goods as the fire itself? In this case, you need to act one stage earlier to avoid damage, with the innovative OxyReduct® fire prevention system.



Natural atmosphere



Oxygen-reduced atmosphere (here 13,5 Vol.-%)



1 Protected area
2 Nitrogen input pipe
3 Operating room
4 Nitrogen generation
5 OxyControl control panel
6 Alarm
7 OXY·*SENS*® oxygen sensor
8 TITANUS® air sampling smoke detection system

Better if it never even starts burning

Where conventional fire protection systems are pushed to their limits, the OxyReduct® fire prevention system, which is recognised and approved by VdS, truly comes into its own. The normal oxygen content of the air in a protected area is reduced permanently and in a regulated manner from 20.9 Vol.-% to below the specified ignition threshold of the stored goods via the addition of nitrogen (see diagram).

The nitrogen generator generates the nitrogen for the oxygen reduction in the designated area directly from the available ambient air. Nitrogen is not toxic and with 78.09 Vol.-% is the main component of ambient air. The material properties of nitrogen ensure a uniform concentration throughout the entire protected area.

Full accessibility

Provided that the recommendations of the employers' liability insurance association are observed, the warehouse can still be accessed and normal warehouse operation is not affected.

VdS Inspected. Approved. Safe.

E 1905001

EXTREME CONDITIONS.
SENSITIVE STORED GOODS.
PARTICULARLY WELL PROTECTED.

The function of conventional fire protection systems can often be adversely affected in deep freeze storage areas. Our applications offer optimal protection even under difficult conditions.

Despite a temperature of -26°C, there is a pronounced fire risk in deep freeze storage areas because of the extremely dry air. At the same time, fire detection and fire extinguishing prove problematic. Condensing humidity and the minus temperatures adversely affect the function of conventional smoke detectors, which only function at as low as -20°C. Extinguishing fires with fire-fighting water containing antifreeze contaminates the goods in food warehouses. Nevertheless, we can protect your warehouse even under these extreme conditions and without any of the problems experienced by conventional systems.

References
(Selection)

apetito
NEWCOLD
Femeg
Eisbär
Kloosterboer
DANISH CROWN

Difficult operating conditions
Our innovative technologies function reliably even under extremely demanding conditions, without displaying the disadvantages of conventional systems, for if a fire has to be extinguished with water containing antifreeze, your stored goods are as good as lost.

Fire protection without antifreeze
That is why our VdS-certified OxyReduct® system springs into action one step earlier: in fire prevention. This is done by reducing the oxygen content of the air in the deep freeze storage area permanently and in a regulated manner via the addition of nitrogen. This is concentrated on the materials stored and therefore avoids the spreading of the fire. The accessibility of the warehouse remains unaffected. The example of Kloosterboer, with a total storage space volume of 420,000 m^3, impressively demonstrates that even large storage areas prove no problem for OxyReduct®.

Detection of the smallest smoke particles
Additionally, electrical equipment and switching cabinets in the protected area are monitored by TITANUS® air sampling smoke detection systems, which can work at as low as -40°C. These allow the detection of even the smallest smoke particles in the pyrolysis phase of a fire, in order to allow the rapid implementation of countermeasures such as disconnecting the power of the equipment in question. This means that your warehouse and your goods are perfectly protected at all times, even under extreme thermal conditions. So it's no wonder that fire prevention is the standard in modern deep freeze storage areas.

MINI-LOAD CONTAINERS WITH HIGH FIRE LOAD. SECURELY PROTECTED AGAINST FIRE WITH THE RIGHT PROTECTION CONCEPT.

The protection of standardised storage containers, so-called mini-load containers, poses a special challenge. They can only be truly protected with an effective fire protection concept.

Mini-load containers: they are practical, but also a fire risk. The plastic that they are made from burns comparatively easily and melts quickly. This can allow a fire to spread quickly by means of the falling, burning plastic drops. Only fire prevention and earliest fire detection can help to avoid considerable damage to high-value stock and maintain the capacity to deliver.

Mini-load containers: practical, but flammable

In storage areas with mini-load containers, stackable, standardised plastic crates are used, which are generally made of polypropylene. From a fire protection perspective, polypropylene poses particular problems as it is especially flammable. In the case of a warehouse fire it acts as a flammable liquid and thus facilitates rapid spreading of the fire downwards. It takes only a few minutes for the plastic to melt and the burning drops to start raining down. These can ignite further mini-load containers and cause a so-called pool fire on the floor. The configuration of the warehouse itself and the associated small gaps left between the stored goods create ideal conditions for a fire to spread. These risks can only reliably be countered with an effective fire protection solution.

OxyReduct® protects mini-load containers reliably

With the OxyReduct® fire prevention system, we offer a fire protection solution which continually reduces the oxygen content to maintain the atmosphere in the mini-load warehouse constantly around the clock at a level where the materials stored can no longer burn.

Remaining risk eliminated

Our TITANUS® air sampling smoke detection systems can also be used in combination with OxyReduct® in mini-load warehouses in order to eliminate, in advance, the remaining risk of a smouldering fire, for example caused by short circuits in electrical equipment. This allows the reliable detection of even the smallest pyrolysis particles in the air. Despite high hall ceilings and entries and withdrawals of stock with corresponding air flows, smoke is still detected as early as possible and reliably even under difficult ambient conditions. Even strong air flows pose no difficulty for our fire detection system, which reliably suppresses false alarms thanks to intelligent signal processing technology, which dismisses phenomena that mimic fires. This allows the timely implementation of countermeasures such as disconnecting the power of the electrical equipment.

FIRE RISK OF HAZARDOUS MATERIALS. INTELLIGENTLY AVERTED. PROTECTED WITH STAGED CONCEPT.

FUCHS LUBRITECH GmbH was faced with a particular challenge – and WAGNER had the personalised solution for the safe storage of hazardous materials.

Safety poses considerable challenges to the operators and fire protection officers of hazardous material stores. The goods stored are often flammable, highly flammable or spontaneously combustible. In addition, substances or their combustion residues can also react fiercely or even be poisonous. We counteract these risks with innovative, intelligent fire protection concepts, with which you can reduce the potential risk of your hazardous material store to a minimum and – as in the impressive solution developed at FUCHS LUBRITECH GmbH shows – negate the need for a separate storage area.

Quite a challenge

As one of the world's leading manufacturers and suppliers of special lubricants, FUCHS LUBRITECH GmbH operates a fully automated 46,000 m^3 high rack storage area for the storage of hazardous materials with very low ignition thresholds. The diversity of the stored hazardous materials and the high fire risk place particular requirements on the fire protection system.

Clever solution – with OxyReduct®

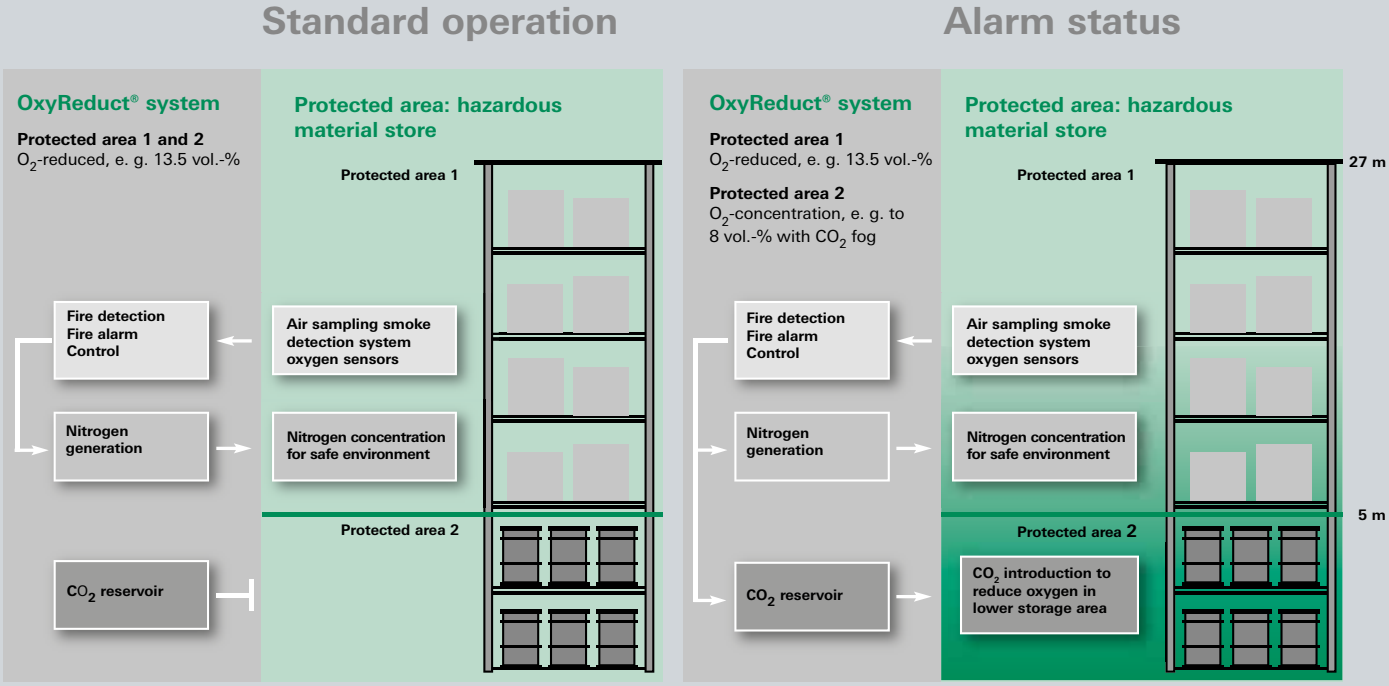
In close cooperation with FUCHS LUBRITECH and VdS-Schadenverhütung GmbH in Cologne, Germany, we developed an innovative storage and fire protection concept, which combines different systems in order to protect the warehouse effectively. This includes the OxyReduct® fire prevention system, which continually reduces the oxygen content in the air to ensure that most substances cannot spontaneously combust.

Now only the remaining risk remains

Additionally, the remaining risk is safeguarded by the flame detector-controlled FirExting® CO_2 inert gas fire extinguishing system, which responds to an alarm by creating a CO_2 extinguishing fog approximately 5 metres in height, which reduces the existing oxygen concentration to 8 Vol.-%, enabling the effective extinguishing of fires. For this reason, particularly combustible and hazardous materials are stored in this part of the warehouse.

The main advantage

The different hazardous materials can all be stored in one warehouse. There is no need for spatial separation. This means that FUCHS LUBRITECH is reliably and effectively protected against fires at all times despite the extraordinarily demanding requirements.



CARDBOARD ROLL STORE.
HIGH RISK.
HIGHEST SAFETY.

A personalised fire protection concept provides Reno De Medici Arnsberg GmbH with the security of maintaining the availability of goods and thus the capacity to deliver.

Reno De Medici Arnsberg GmbH uses state-of-the-art technology to produce 185,000 tonnes of high quality folding cartons annually. Their customers include foodstuff companies, pharmaceutical companies and manufacturers of washing detergents and cosmetics. To avoid endangering the reliability of their deliveries in this highly competitive business, Reno De Medici has also decided to use state-of-the-art technology in its fire protection concept with OxyReduct® and TITANUS®: The company from the Sauerland region of Germany didn't want to take any risks because of the particular high fire load in the paper store.

Complicated conditions

The rolls in the Reno De Medici roll store are stored in close proximity. A fire here would eat its way through the individual paper layers and form deeply located hot spots, which can be extremely difficult to extinguish as fire-fighting water can barely penetrate to where the embers are. This allows a fire to spread almost unhindered and cause immense damage in combination with the fire-fighting water. If this damage compromises the capacity to deliver, this can quickly result in the loss of business relationships and turnover in this highly competitive environment.

Simple solution: OxyReduct®

To make sure it never comes to that, Reno De Medici has put its trust in the reliable OxyReduct® fire prevention system. The introduction of nitrogen generated on site reduces the oxygen concentration in the 31,000 m^3 warehouse in a controlled manner to a level where the paper rolls can no longer burn. This also removes the risk of a fire which might be brought in from outside via goods being entered into stock, for example, as it makes it impossible for the fire to spread.

Remaining risk? Perfectly protected!

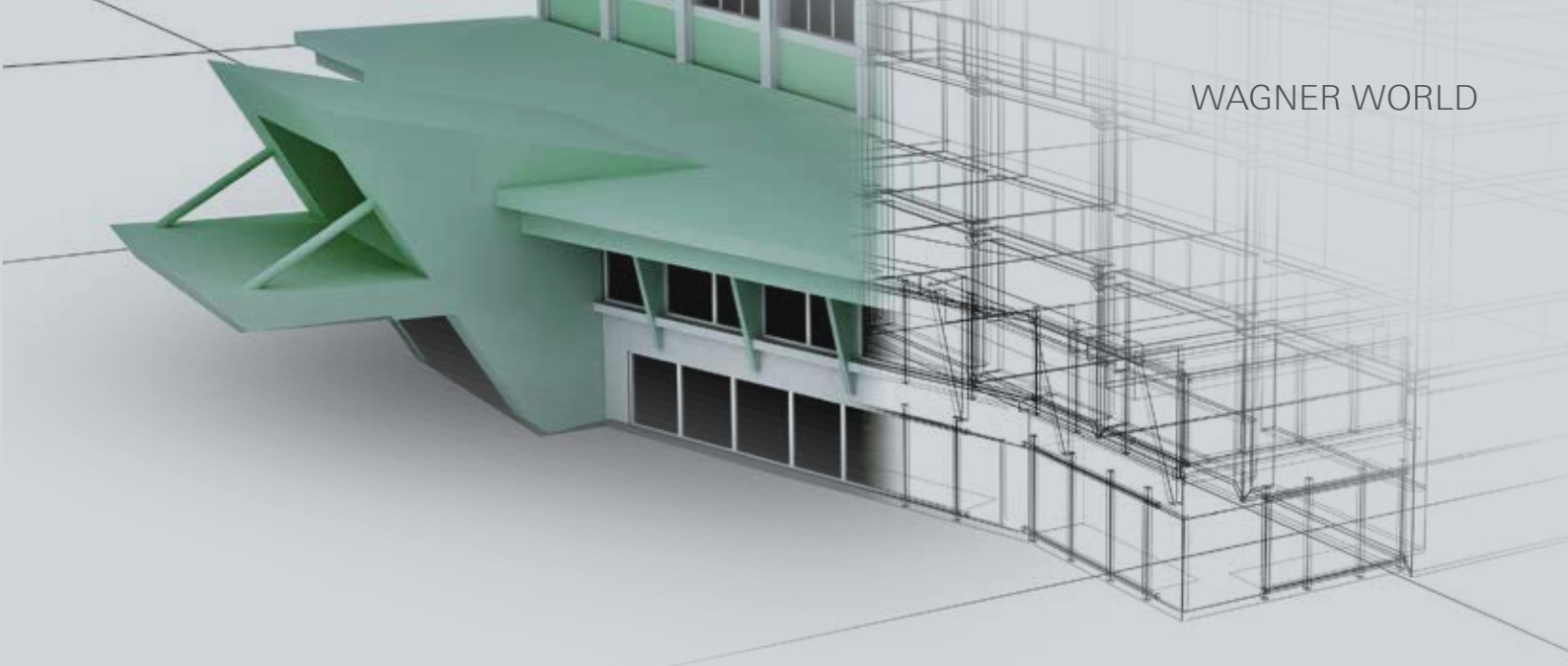
To reduce the remaining risk as far as possible, we have additionally combined OxyReduct® with the TITANUS® earliest fire detection system, in order to detect the smallest pyrolysis particles originating from defective electrical equipment or in switch cabinets. This allows countermeasures to be implemented immediately.

Nitrogen generator (left) for the generation of nitrogen, one of the core components of an OxyReduct® fire prevention system.

UNDERSTANDING FIRE.
DEVELOPING SOLUTIONS.
WAGNER WORLD.

WAGNER WORLD offers you the chance to experience innovative fire protection solutions for yourself.

What risks are lurking in my warehouse? How can I guarantee the maximum reliability of my logistics? WAGNER WORLD brings fire protection to life and makes it easier to understand. It offers you the opportunity to experience the technologies today, which will become the standards of tomorrow. And, of course, to receive competent answers to all your questions.



Experience state-of-the-art technology
Intelligent, forward-looking fire protection is a complicated subject, which is why we opened WAGNER WORLD at our headquarters in Langenhagen, Germany, to clear up unresolved questions and provide answers.

Realistic fire tests
Realistic fire tests are performed in the new laboratories to demonstrate the different combustion behaviours of different materials, for example. In the WAGNER WORLD auditorium, our experts host regular workshops and seminars informing our customers, fire protection officers, insurance experts, fire brigades and public authority representatives of current, general and trade-specific fire protection problems.

Technology put to the test
In addition, you the visitor can put our TITANUS® earliest fire detection system to the test in a permanent exhibition and experience OxyReduct® live in action.

WAGNER – Innovative fire protection since 1976
At WAGNER, we have been developing integrated, personalised fire protection concepts for our customers since 1976. With our innovative solutions, we are now a trend-setter in the market and as a complete service provider we are in a position to deliver you everything from one source: from support in the design, planning and installation of your fire protection solution up to service and support throughout its entire service life, across the world and wherever your need us.

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WAGNER sets standards in fire protection – with innovative and comprehensive solutions

Fire detection and alarm systems

Very early fire detection systems (TITANUS®)

Active fire prevention (OxyReduct®)

Fire extinguishing (FirExting®)

Hazard management (Visu*LAN*®)