



**LUBRITECH**  
Special Application Lubricants

Reference solution

# Fire protection for a hazardous materials warehouse

OxyReduct®

FirExting®

TITANUS®

A holistic  
fire protection concept  
for the Fuchs Lubritech  
hazardous materials  
warehouse

## THE CUSTOMER

The international provider of specialist lubricants, pastes, solid film lubricants and release agents is committed to “smoothly moving demanding technology”.



The Fuchs Lubritech GmbH automated high-bay warehouse



Products with different hazardous material classes under one roof – all safely protected against fire risks

**Hazardous materials with the broadest range of ignition thresholds in one large high-bay warehouse: this was the challenge with which Fuchs Lubritech approached WAGNER.**

To meet its commitment to high levels of product quality and service, Fuchs Lubritech operates a high-bay warehouse at its main site in Kaiserslautern. This is protected against fire risk and guarantees the availability of the products subject to international demand.

Fuchs Lubritech produces specialist lubricants and release agents for all industrial application areas from the automotive and construction industries to the mechanical engineering and agricultural ones. The fully automated, 46,000-cubic-metre high-bay warehouse in Kaiserslautern offers storage space for concrete release agents, adhesive lubricants, lubricating liquids and lubricating grease, pastes, solid film lubricants, aerosols, glass processing media and forming lubricants – all in all, over 1,000 specialist products tailored to the relevant areas of use. The sheer diversity of the hazardous

materials stored and the high fire risk establish special requirements when it comes to fire protection.

Potential consequences of a fire could include not only commercially damaging operational interruptions but also sensitive damage to the environment as a result of toxic combustion residues, fire gases and soot. The fire extinguishing options are also restricted due to the risks of poisoning, potentially released hazardous materials and explosion.

## THE RISK ANALYSIS

Flammable and highly combustible stored goods pose major potential hazards.

**In hazardous materials warehouses, safety poses major challenges for both operators and fire protection officers. The stored goods are flammable and slightly to extremely combustible. In addition, substances or their combustion residues can also react fiercely.**

This leads to a risk of poisonous secondary products and toxic gases being created. Fire prevention concepts based on reducing the hazard potential from the outset have proven effective at keeping these dangers at bay.

When it comes to handling hazardous materials, companies have to meet a variety of safety regulations, such as the Regulation on Flammable Liquids (VbF), the resultant Technical Regulations on Flammable Liquids (TRbF) and the Technical Regulations on Hazardous Materials (TRGF). VdS guidelines regulate, among other things, the usage and storage of flammable materials in separate areas from a fire protection perspective. Fuchs Lubritech GmbH, one of the world's leading manufacturers and suppliers of specialist lubricants, aimed to store a variety of hazardous materials – some with extremely low ignition



Fuchs Lubritech GmbH was faced with a particular challenge – and WAGNER had the customised solution for the safe storage of hazardous materials.

thresholds – in a single high rack warehouse without physically separating them. As such, the 46,000-cubic-metre storage facility in Kaiserslautern employs

a combination of two different fire protection systems: active fire prevention and the rapid lowering of the oxygen level through the use of a CO<sub>2</sub> extinguishing system.

## THE PROTECTION OBJECTIVE

**The following protection objectives were defined in the project planning stage for fire prevention in the high rack warehouse:**

■ **Prevent fires from breaking out or spreading in order to minimise the level of damage**

■ **Prevent harm to personnel, goods and the environment**

■ **Maintain the ability to deliver and the goods flow**

## THE SOLUTION

Multi-level protection concept offers high efficiency: active fire prevention through oxygen reduction is combined with a CO<sub>2</sub> inert gas extinguishing system



TITANUS® air sampling smoke detectors for the earliest possible smoke detection



The OxyReduct® fire prevention system keeps the oxygen content in the warehouse at a constant level of 13.5 vol. %

### **The holistic fire protection solution for the hazardous materials high rack warehouse**

WAGNER has worked with Fuchs Lubritech and VdS-Schadenverhütung GmbH in Cologne to develop an effective fire prevention concept that combines several systems to effectively protect a hazardous materials warehouse. This allows the joint storage of products with different hazardous material classes in a single room.

Firstly, an OxyReduct® active fire prevention system is used. This permanently reduces the oxygen content in the air from the normal

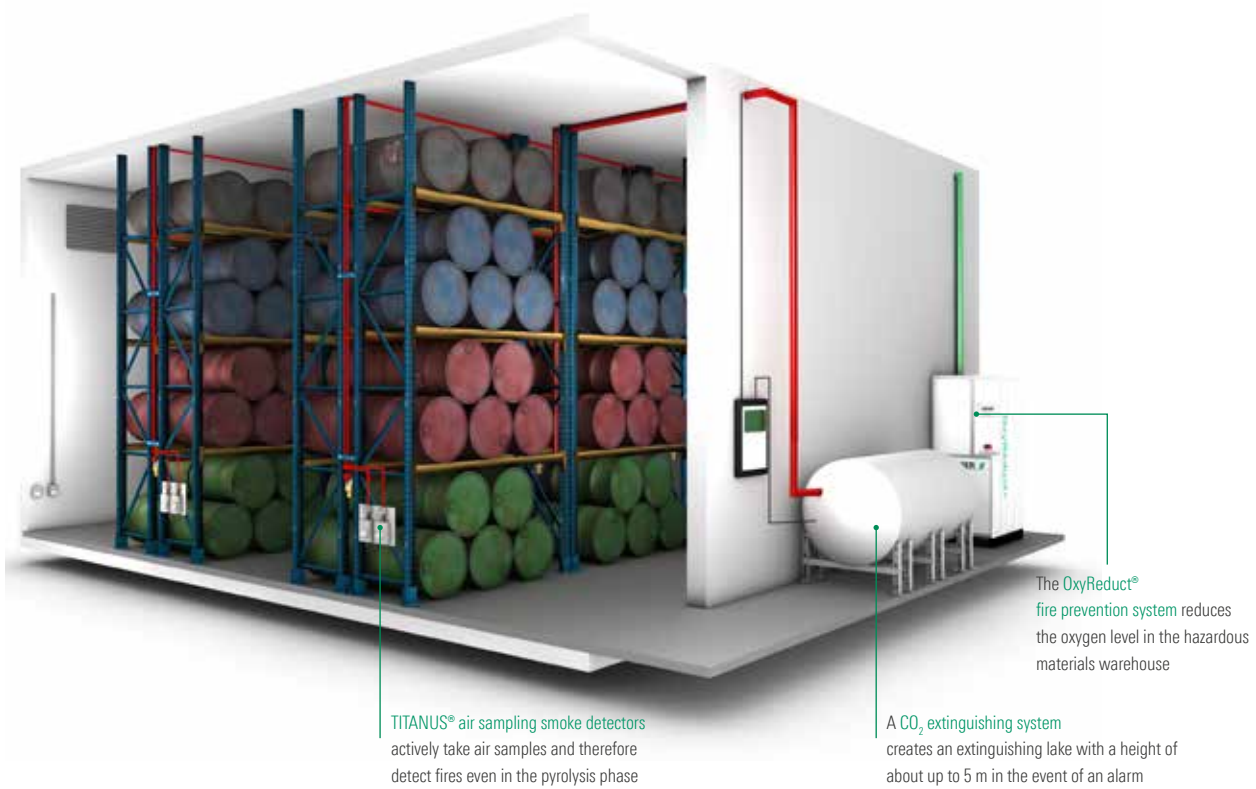
level of 20.9 vol. % to 13.5 vol. % to ensure that most substances cannot spontaneously combust. The oxygen level is reduced through the supply of nitrogen, which is directly obtained from the ambient air on site. Nitrogen is ideal for fire prevention as it can be easily obtained as a main component of the air, is available in an almost unlimited quantity and is non-toxic.

A fire detection system using TITANUS® air sampling smoke detectors guarantees the earliest smoke detection in the event of a fire. Finally, a FirExting® CO<sub>2</sub> inert gas extinguishing system

triggered by flame detectors ensures the residual risk. In the event of an alarm, this generates a CO<sub>2</sub> extinguishing lake with a height of up to about five metres, which reduces the existing oxygen concentration to 8 vol. %, thereby countering any fire in a particularly effective manner. For this reason, particularly combustible and hazardous materials are solely stored in the lower sections of the warehouse – and without requiring any additional structural measures.

# SYSTEM DIAGRAM

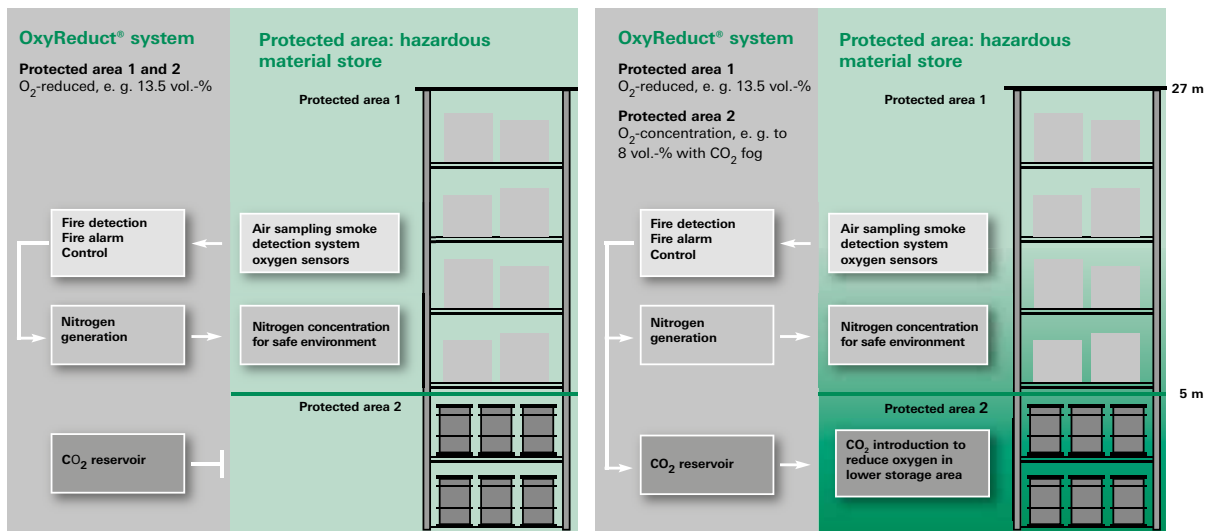
The fire prevention system reduces the oxygen level in the protected area by supplying nitrogen, the CO<sub>2</sub> extinguishing system builds an extinguishing lake in the event of an alarm. This allows the joint storage of products with different hazardous material classes in a single room.



## OxyReduct® with CO<sub>2</sub> extinguishing lake

Standard operation

Alarm status



# WAGNER Group Plant Engineering & Construction



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

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## Fire detection and alarm systems

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Very early fire detection systems (TITANUS®)

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Active fire prevention (OxyReduct®)

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Fire extinguishing (FirExting®)

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Hazard management (VisuLAN®)