

Experts in fire protection

**MINIMAX**

## LiquidProtect – Fire Suppression System for Flammable Liquids Storage



SPECIAL SOLUTIONS

LIQUIDPROTECT



Every step in the right direction leads to the goal.  
In all Minimax activities, one of management's goals is to ensure the health and safety of our customers and employees and to protect the environment.



## The situation: Risks in your flammable liquids warehouse



Hazardous materials warehouse with flammable liquids

### Many goods stored in a small area pose existential risks for companies

More than one third of major fire losses occur in warehousing and logistics areas. The risk is even higher when hazardous materials are stored in considerable quantities in a small area.

### With flammable liquids fire fighting is even more challenging

Even small amounts of flammable liquids make fire fighting difficult. 1,000 liters of liquid spill spread over an area of about 300 m<sup>2</sup>.

### Three-dimensional liquid fires in racks

Liquid fires generate enormous amounts of heat, causing extensive damage and endangering lives in rack arrangements.



# Our solution: LiquidProtect, the innovative fire fighting solution

It protects your flammable liquids warehouse with a specifically designed sprinkler system.



LiquidProtect in operation

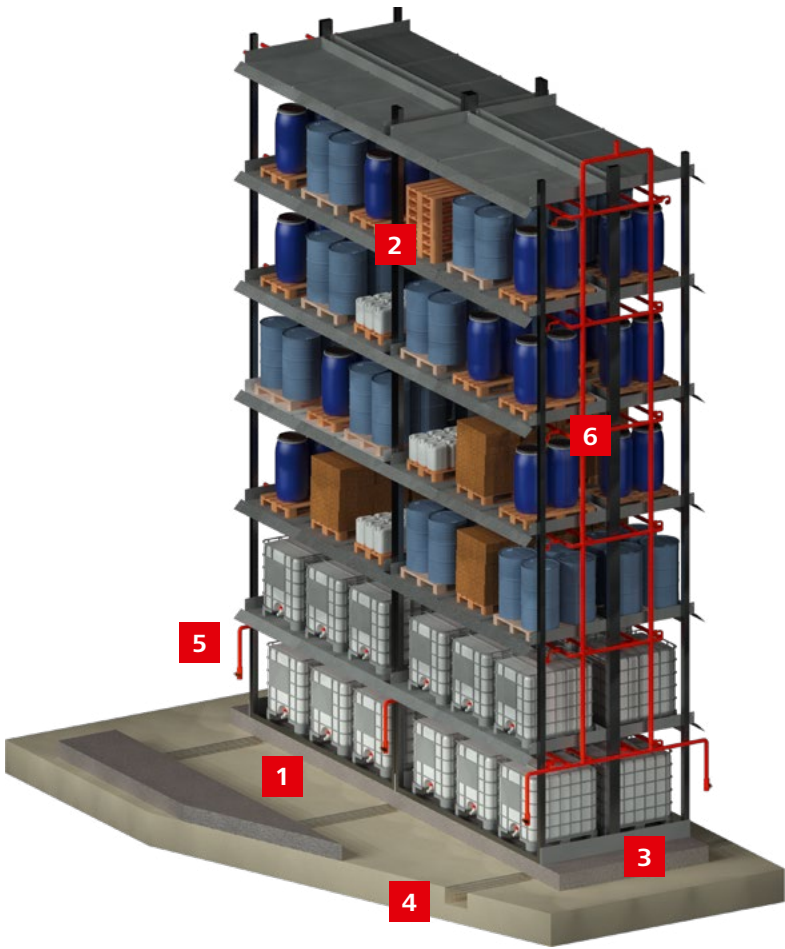
- **Effective fire fighting**  
Thanks to the pinpointed arrangement of the sprinklers in the racks and aisles, incipient outbreaks of fire are detected at an early stage and suppressed locally with a foam water mixture – without necessary pre-warning time.
- **Fire fighting in seconds**  
In the case of fire, time is the crucial factor. LiquidProtect is a fire fighting system that applies fire fighting agent without delay.
- **Minimal business interruption**  
With LiquidProtect, there is less primary and secondary damage to building and rack structures as well as to technical equipment. This means that operations can be resumed quicker after a fire.

- **High protection for people and the environment**  
Thanks to the combination of FuelStops and the special sprinklers installed, the fire can be fought at an early stage and with small amounts of fire fighting agent.
- **Proven, innovative fire fighting solution**  
LiquidProtect is a special sprinkler system with VdS approval.



# LiquidProtect stands for effective fire fighting

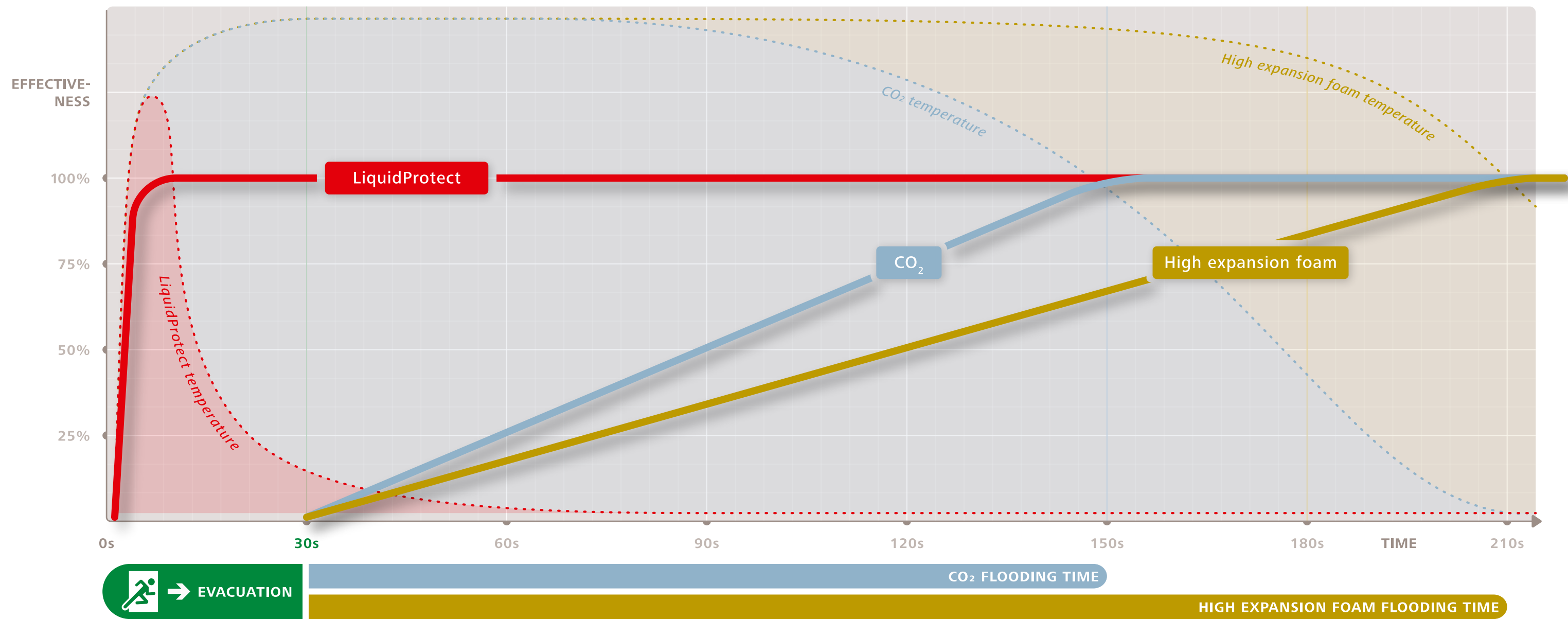
7 coordinated components form the framework.



- 1 Rack aisle**  
where the escaping liquid is discharged
- 2 Guide plates**  
direct the flammable liquid into the aisle
- 3 Rack base**  
prevents the liquid from running under the rack
- 4 FuelStops**  
set into the floor at regular intervals, trap the flammable liquid and limit its spread
- 5 Special aisle sprinklers**  
ensure rapid activation and targeted distribution of the fire fighting agent
- 6 Special rack sprinklers**  
distribute the fire fighting agent specifically into the rack bay
- 7 Fire fighting agent**  
made of water with a special foam concentrate that effectively combats flammable liquids with a low flash point and reduces the outgassing of hazardous compounds from pools

# Every second counts

Instantaneous start of the fire fighting with LiquidProtect



Effectiveness of different fire suppression systems in comparison

The LiquidProtect fire fighting system kicks in immediately and without delay, fighting fires directly at the site of the fire. Only LiquidProtect achieves its effectiveness after just a few seconds, lowering the temperature instantly. Valuable time to save goods and merchandise from destruction.

Fire departments and fire safety professionals know: The more resolute and rapid the action against the fire, the less the damage to people, goods, and the environment.

**Stored goods: Flammable liquids, polar and nonpolar**

- Polar substances with a flash point down to -22 °C
- Nonpolar substances with a flash point down to -7 °C

**Containers**

- IBC\* up to 1,000 l in the 1st and 2nd level
- Metal IBC without pressure relief
- Plastic barrels and canisters up to 220 l
- Metal barrels and canisters up to 216.5 l
- Lidded barrels
- Metal and plastic bung drums

**Storage form**

- Rack storage in single or double row racks
- Max. six storage levels at a max. height of 1.7 m each
- Aisle width 1.45 to 5.00 m
- Max. ceiling height 15 m

**VdS approval**

- LiquidProtect is a fire protection fighting system with VdS approval for flammable liquids warehouses

\* Intermediate Bulk Container



# LiquidProtect offers several advantages

It is clear why LiquidProtect is so frequently installed in flammable liquids warehouses.

	CO <sub>2</sub>	High expansion foam	Liquid Protect
High personal and environmental safety	+	+	+++
Fire fighting possible during evacuation	–	–	+++
Immediate effect (no system-related pre-warning time)	–	–	+++
No impaired visibility from the fire fighting agent itself	–	–	+++
Suitable for fighting deep seated fires	++	–	++
Localized fire fighting	–	–	+++
Limited formation of pools = lower fire propagation	–	–	+++
Minimizes economic damage in the case of fire	++	+	+++
Fire fighting agent works residue free	+++	–	+
Minimal business interruption in the event of unintentional activation	+	–	++
Large storage areas possible, no division of spaces into small fire fighting zones	–	–	+++
Structural means (pressure relief vents, building tightness)	–	+	+++

# Effectiveness

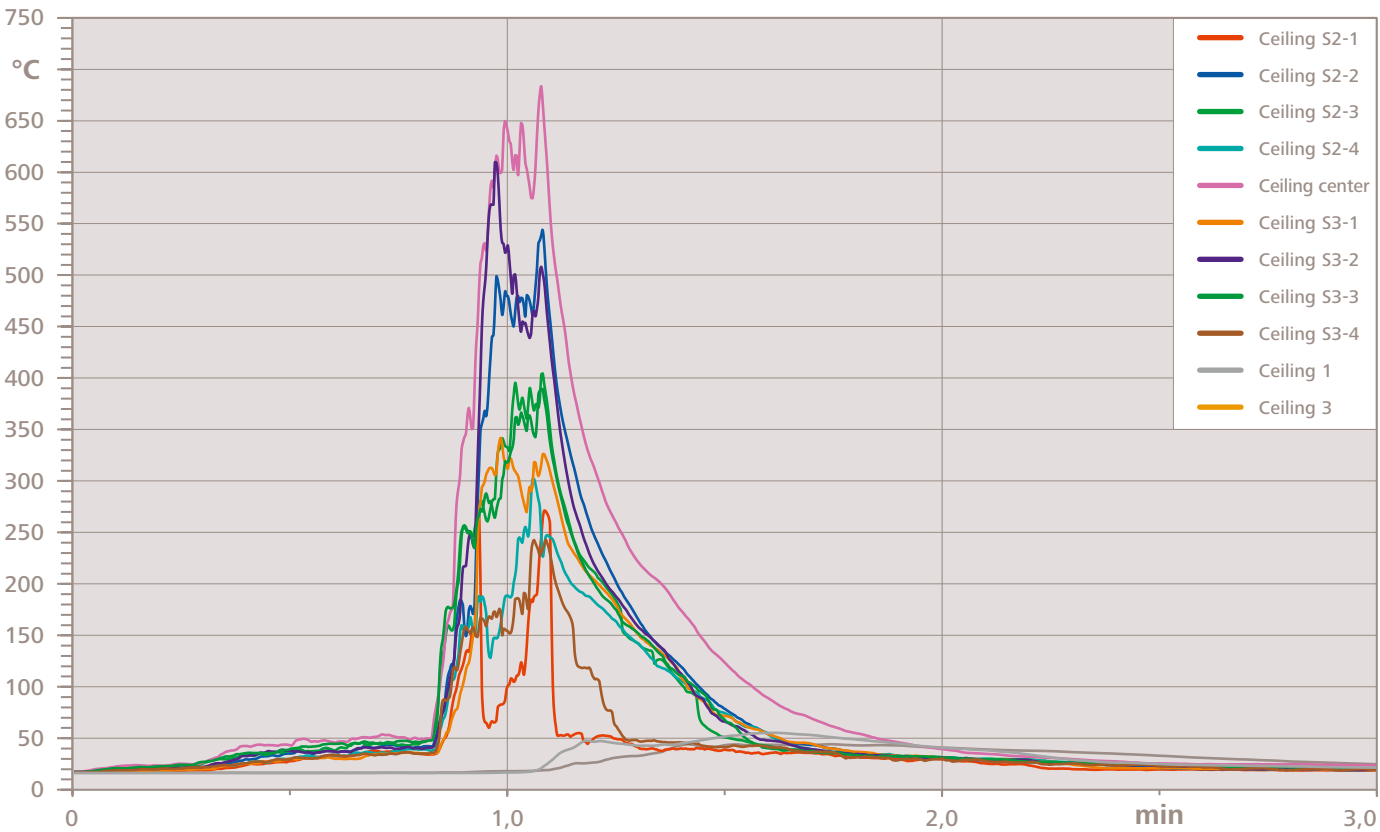
A tested and approved fire fighting solution

Minimax developed LiquidProtect for flammable liquids storage at its in-house fire research center. The effectiveness of the system was examined and confirmed by experts from VdS Schadenverhütung in full-scale fire tests.

## Performed tests and scenarios

Countless risk assessments were carried out to provide a safe and optimized fire fighting solution:

- Drop tests with filled containers from different storage heights
- Flow behavior of liquids from opened or damaged containers
- Fire fighting agent distribution within rack bays and aisles
- Determination of the foam expansion rate of various special sprinklers
- Fire tests with different storage configurations, storage heights, and points of ignition
  - In different substance quantities
  - With different polar and nonpolar flammable liquids
  - Fire tests with flammable liquid spill over a large area in the rack aisle
  - Two-dimensional and three-dimensional pool and flowing fires as well as combinations thereof
  - Impact of spray obstructions



Temperatures during a full-scale fire test



## LiquidProtect impresses with...

- Effective, localized fire fighting
- Very rapid fire fighting
- Minimal business interruption in the case of fire
- High personal and environmental safety
- VdS approval

Our claim: Development of ever better fire fighting systems and products that detect fires at an early stage and successfully fight them with minimal effort, using environmentally friendly fire fighting agents.



