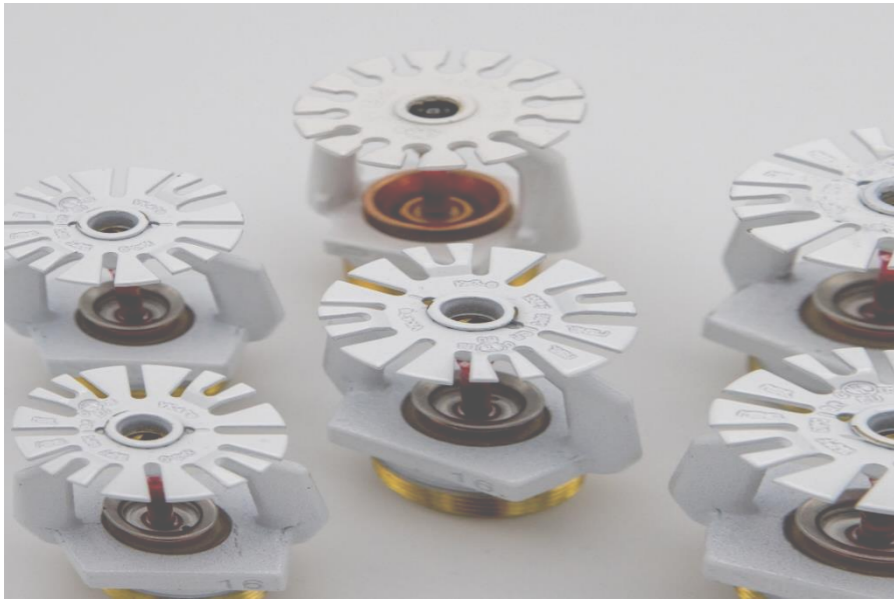


Measures to reduce the environmental impact of sprinkler systems



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Agenda

1. Introduction
2. Fire Sprinklers; an intrinsically sustainable option
3. Possible measures
4. Stimulating implementation of measures
5. Questions

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Verenigde Sprinkler Industrie
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PYROCK

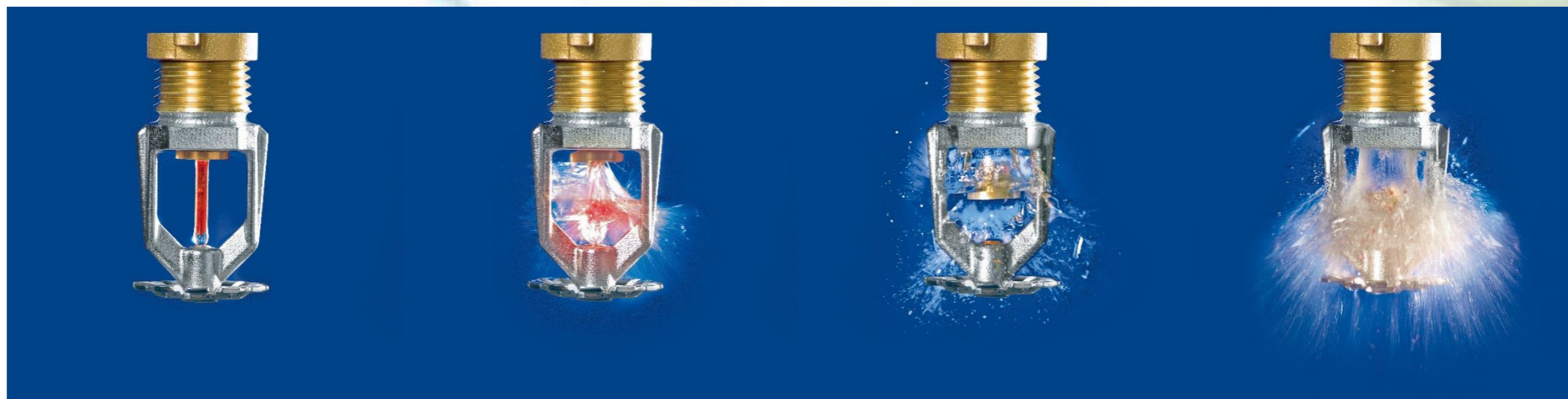
u/c *Installatietechniek*


ominio
HANDEL + BEWERKING VAN BUIS EN FITTING


BOELE FIRE PROTECTION


ODS
klöckner & co multi metal distribution

Added value of sprinklers



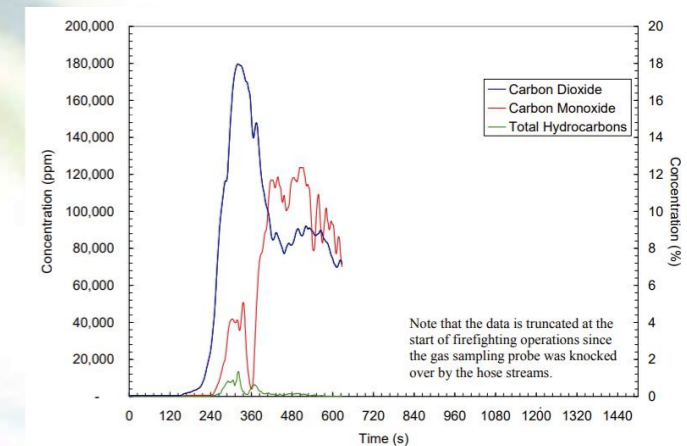
Sprinklers are intrinsically sustainable

- Fire is very limited!
- Not the goal; but usually automatically extinguished
- Buildings can't burn down
- Minimizing harmful flue gas emissions
- Preserving precious raw materials
- Ensuring business continuity
- Uses less water than the Fire service to extinguish a fire

Sprinklers are sustainable

Reports

- ❑ Environmental impact of Automatic Fire Sprinklers (FM Global) & Environmental impact of Residential Fires
- ❑ Fire Safety Challenges of 'Green' Buildings and Attributes (NFPA Research Foundation)
- ❑ Business Resilience Through Property Protection (BSA)
- ❑ Assessing the role for fire sprinklers (Bureau Veritas)



Sprinklers are sustainable

Environmental Impact of Residential Fires Review:

- Greenhouse gas emissions were cut by 97.8%
- Water usage was reduced between 50% and 91%
- Fewer persistent pollutants, such as heavy metals, were found in sprinkler wastewater versus fire hose water
- The high pH level and pollutant load of non-sprinkler wastewater are an environmental concern

Source: <https://homefiresprinklercanada.ca/fire-sprinklers-are-green/>

sprinklered vs. nonsprinklered

Less greenhouse
gas emissions

Reduced
water usage



sprinklered

vs.



nonsprinklered

vs.



sprinklered

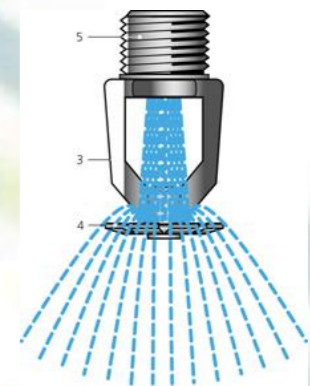


nonsprinklered

Source: <https://homefiresprinklercanada.ca/fire-sprinklers-are-green/>

Possible measures

1. Limiting water consumption in testing
2. More efficient use and protection of sprinkler pump sets
3. Combination sprinkler system with a heat/cold storage system
4. Use of fire extinguishing water supply for energy saving
5. Extending the lifespan of sprinkler pipes by protecting the installation
6. Applying more sustainable materials
7. Sustainable maintenance



1. Limiting water consumption in testing

Guarantee reliability; Maintenance and testing is necessary!

Alternatives:

Integral test with Inspection Test Connection (ITC)

- Use specific test units: circulating water to test flow switches
Activated remotely and suitable for hard-to-reach places
- Electronic test and monitoring systems
Self-testing flow switches, pressure switches also on the alarm valves.
Remotely, which also limits travel movements.
- Returning test water to supply

2a. More efficient use and protection of sprinkler pump sets

Use of speed pressure control

A: Efficient use

- Alternative for mechanical relief valves (overpressure)
- Optimum design, unfavorable conditions, limiting 'dead pressure
- Optimum fuel consumption and exhaust emissions

B: Protecting pump sets

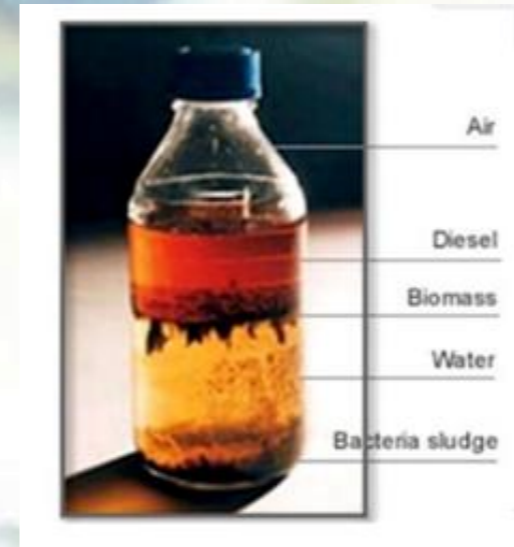
- Protection from cavitation damage
- Against 'abuse' >oil distribution & turbo



2b. More efficient use and protection of sprinkler pump sets

Biodiesel

- Correct Storage
- Cleaning fuel (Sludge)
- Alternative fuels:
Gas To Liquid,
Hydrotreated Vegetable Oil



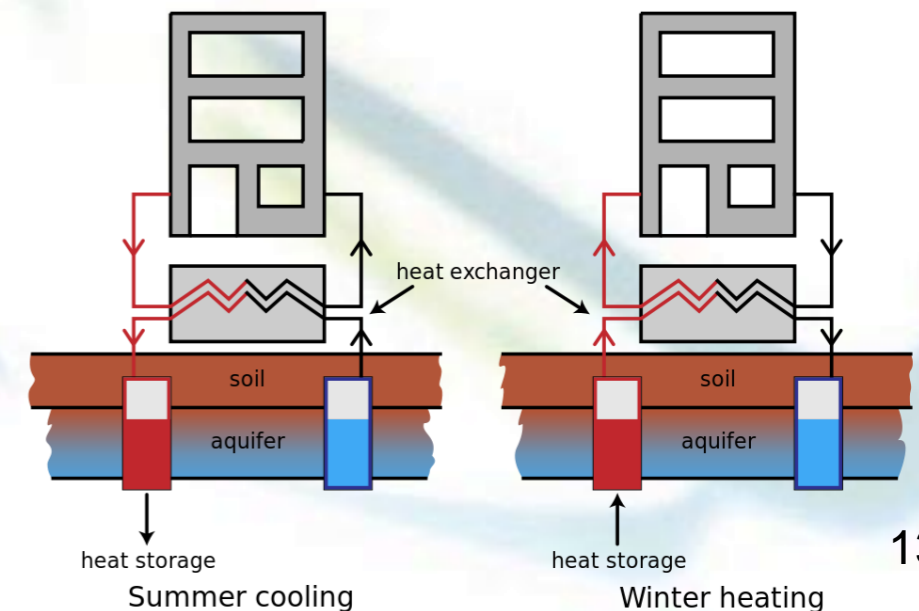
3. Combination with a heat/cold storage system

Higher requirements for maximum energy consumption of buildings

- increasingly use of heat and cold storage installations
- approximately 100 to 400 m³ per hour
- Sufficient for average need for a sprinkler installation in a utility building
- Collective fire extinguishing water supply distribution centers up to 1,200 m³ per hour



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4. Use of fire extinguishing water supply for energy saving

Energy transition! By 2050, energy supply must be almost completely sustainable and CO2-neutral

Every owner of a tank an energy Supplier!

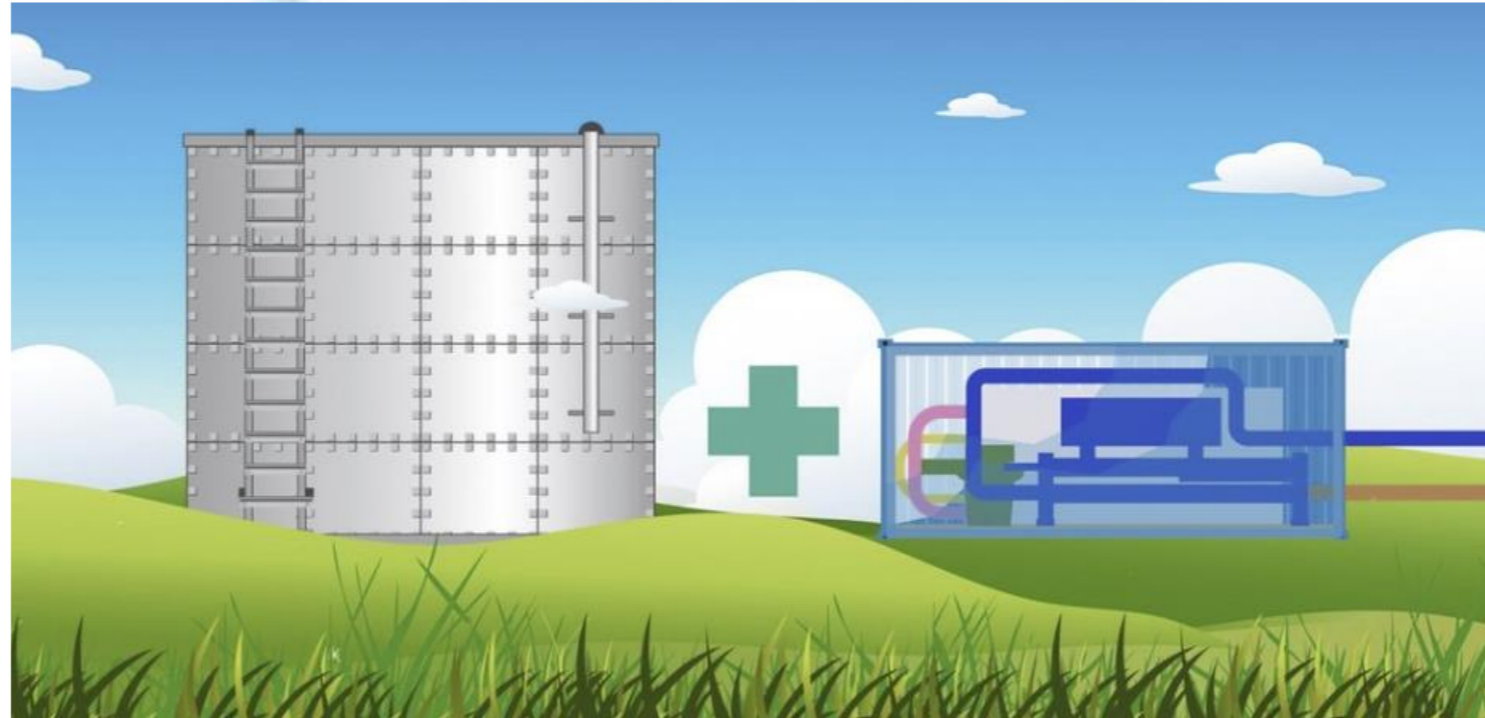
Water sprinkler tanks as energy source for **heating**
More than 60 % saving on gas.

Water sprinkler storage as energy source for **cooling**

- Limited capacity excellent as backup
- Improving operational reliability of critical systems

4. Use of fire extinguishing water supply for energy saving

innovation prize for **Sprinkler Energy**



5. Extending the lifespan of sprinkler pipes

Protecting the installation against internal corrosion

- Automatic air vents'; remove 'trapped air'
- Oxygen reduction < 2% with nitrogen



6. Applying more sustainable materials

Buildings as a warehouses of materials

Use of materials that are less sensitive to corrosion, aging and wear:

> ensures that materials can be used longer and therefore more durable

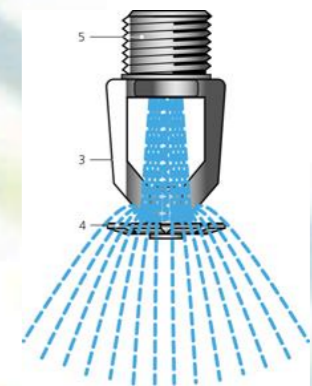
- Coating on steel pipes
- Use of other materials
- Protecting sprinkler tanks
- Less friction, thinner pipes
- BIM as a materials passport

Groove connection technique is extremely suitable for the (non-destructive) disassembly of a sprinkler system

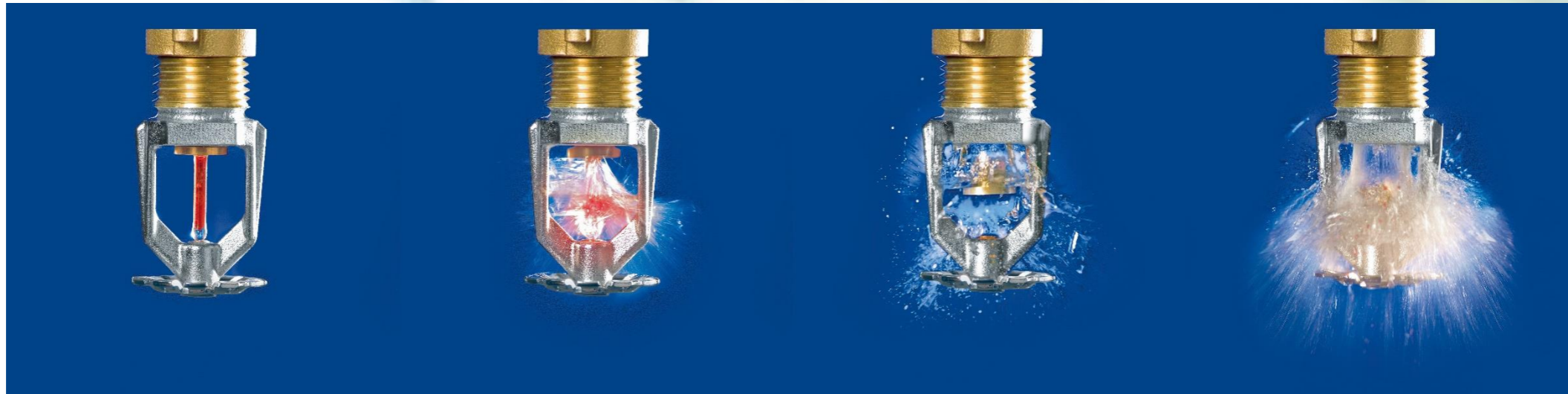
7. Sustainable maintenance

Advices

- Make sustainable in initiation project phase, part of program requirements of the fire safety concept
- Use qualified sprinkler contractors and specialists
- Be aware of the difference between management and maintenance of sprinkler installations



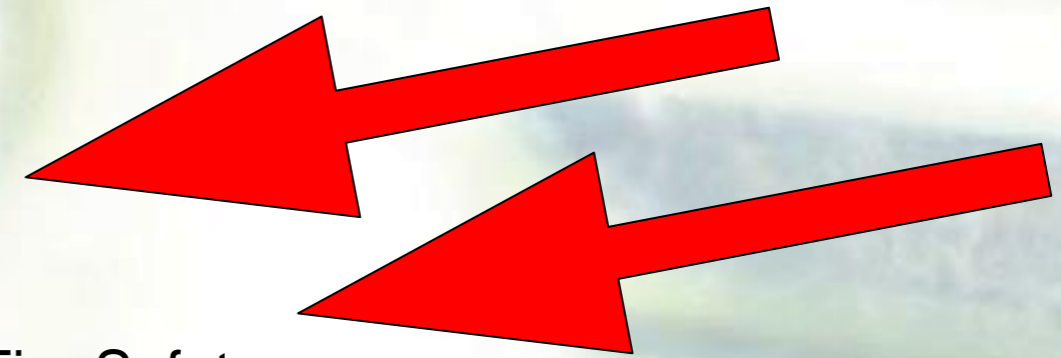
How to get the measures implemented?



1. Limiting water consumption in testing
2. More efficient use and protection of sprinkler pump sets
3. Combination sprinkler system with a heat/cold storage system
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Cause of fire safety problems

- ❑ Laws and regulations are not understood
 - > clients do not set any requirements for fire safety
- ❑ Sustainability and Fire Safety are not connected
 - > Sustainability Assessment Method not included in Fire Safety
 - > Consultants have conflicts of interest
- ❑ Construction process is complicated
 - > clients relinquish control of (re)construction
 - > insufficient coherence of measures
- ❑ Opportunistic about effectiveness of (internal) emergency services
 - > ignoring risks and shorter survival time
- ❑ Fire safety is regarded as costs
 - > no measures for damage limitation, continuity, liability and reputational damage
- ❑ Increasing fire risk and faster fires
 - > increasing risks and shorter survival time ignored



Fire Safety is a choice!

Sustainability is also a choice!

Question:

What consequences of a fire do you accept? and which not?

Know the difference between:

Building regulation purpose: almost limited to escape safety

Private aim: damage limitation, continuity, sustainability

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Thank you!



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