



## Preventing corrosion and contamination ensures reliable sprinkler systems and fire prevention

Results of 10-year internal investigation in NL



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Achieving and  
maintaining compliance



CO<sub>2</sub>-reduction strategies  
and implementation



Improving safety in  
the work environment



Executing  
projects

## Outline of the talk

1. The current situation in the Netherlands regarding regulations
2. Practical experience and results
3. Insights
4. Sustainable sprinkler systems



## The current situation in the Netherlands

Certified sprinkler systems must comply with the Technical Bulletin (TB):

- TB67B: condition of the **sprinkler tank**
- TB80: maintenance of **sprinkler systems**

after 5 years:

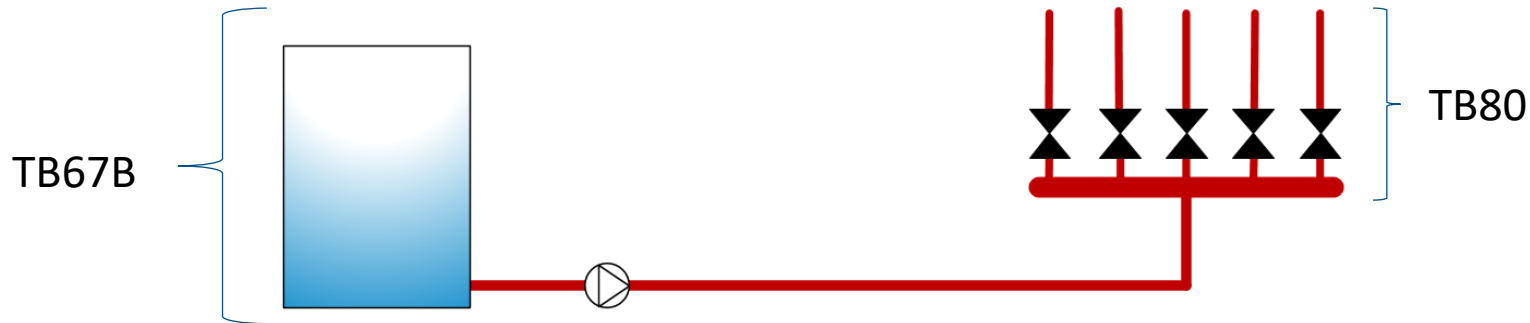
after 10 years of use:

1x/15-year:

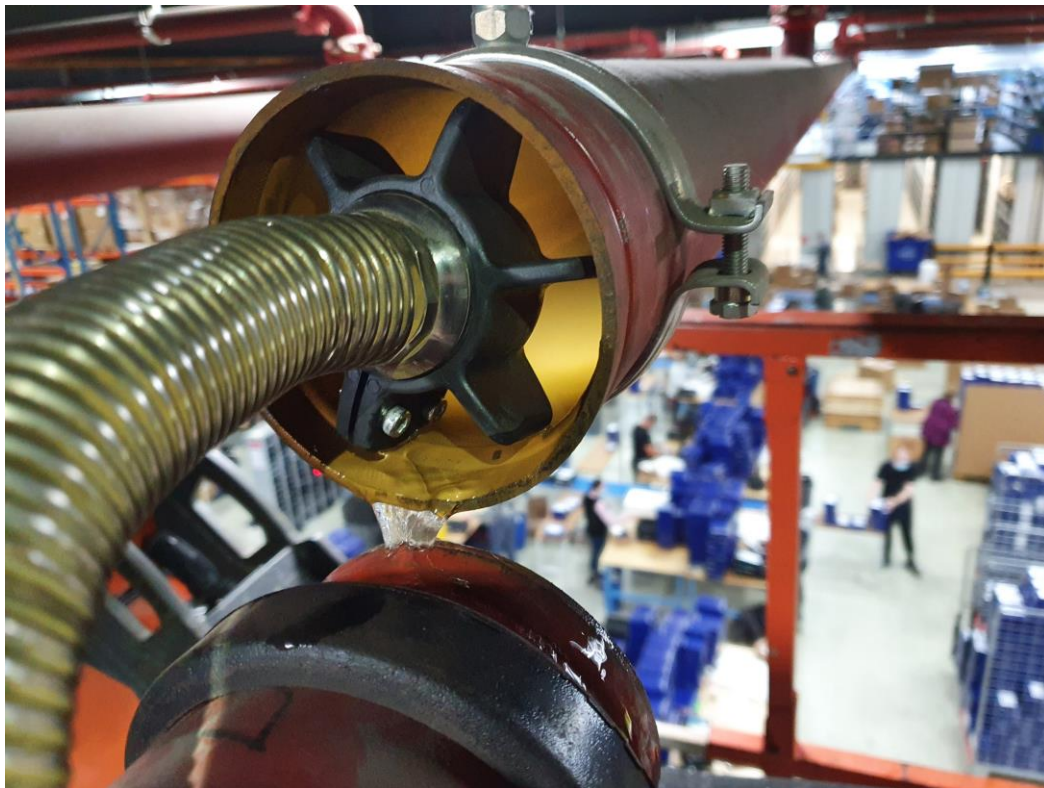
inspection with camera or diver

inspection and maintenance of emptied tank

internal inspection of sprinkler pipes, alarm valve and sprinklers



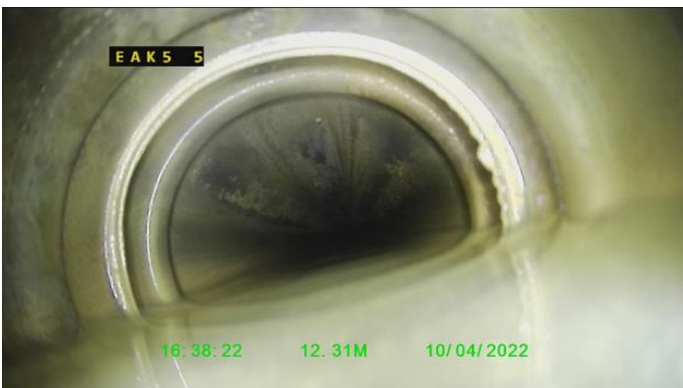
## Practical experience and results



## What we like to see



# Camera view investigation wet sprinkler lines



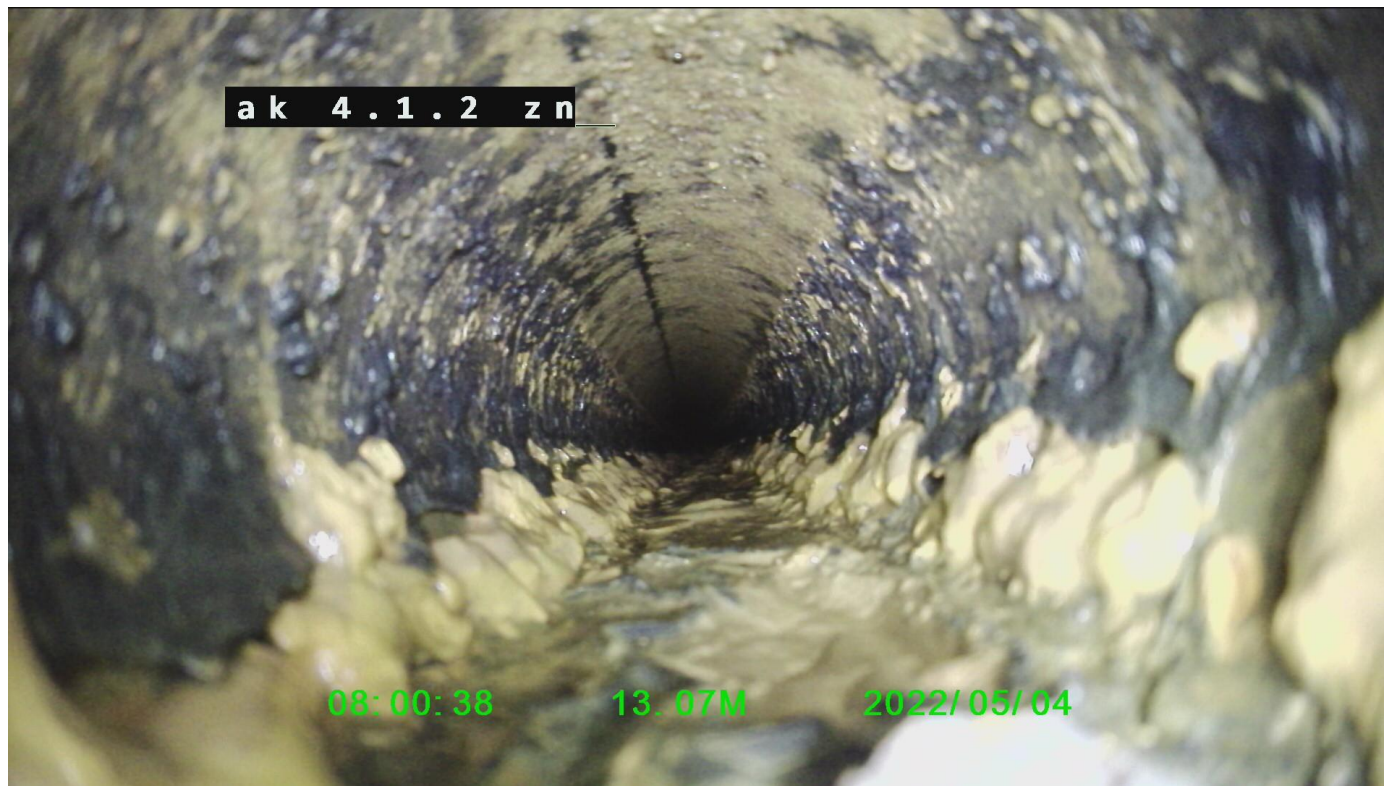


## Galvanized steel





## Carbon Steel



# Sludge



## Water research

### Water composition study

- Water from sprinkler tank or basement
- Water in sprinkler sections
- Chemical and bacteriological parameters

### Results

- Water in sprinkler **tank** and sprinkler **basement** is often **bacteriologically heavily contaminated**
- Water in sprinkler sections give varying picture, bacteriologically clean to heavily contaminated

Mentioned results **confirmed** by the **TB67B inspection** of the sprinkler tank.

- The bitumen coating has disappeared after 10 years
- Metal in a liner tank is often severely affected by MIC

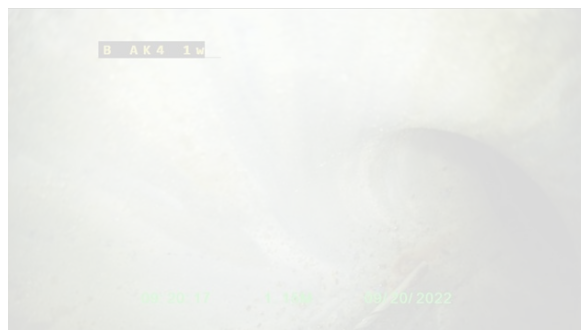
## Water

- Original sprinkler system is supplied with **clean drinking** water during/after construction.
- After several years the water in the tank or basement **bacteriologically contaminated**.
- **Refilling** with water from tank or basement after maintenance or investigations, **introduces contamination**.

Crucial times that corrosion occurs especially in sprinkler systems:

1. During construction
2. Maintenance/modifications

# Objects also found in sprinkler pipes

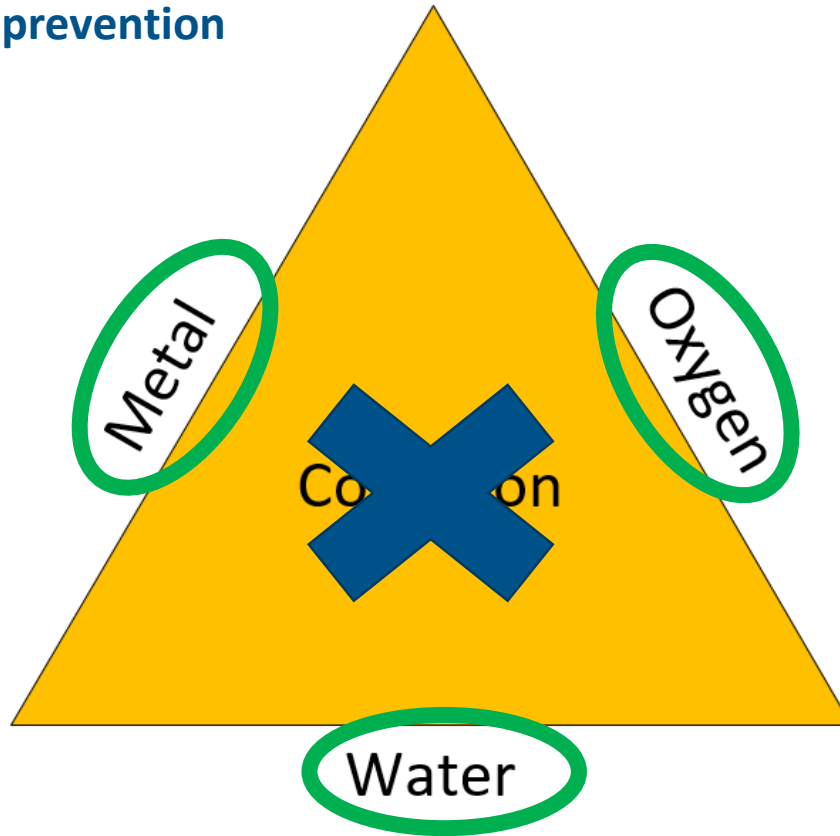


## Results

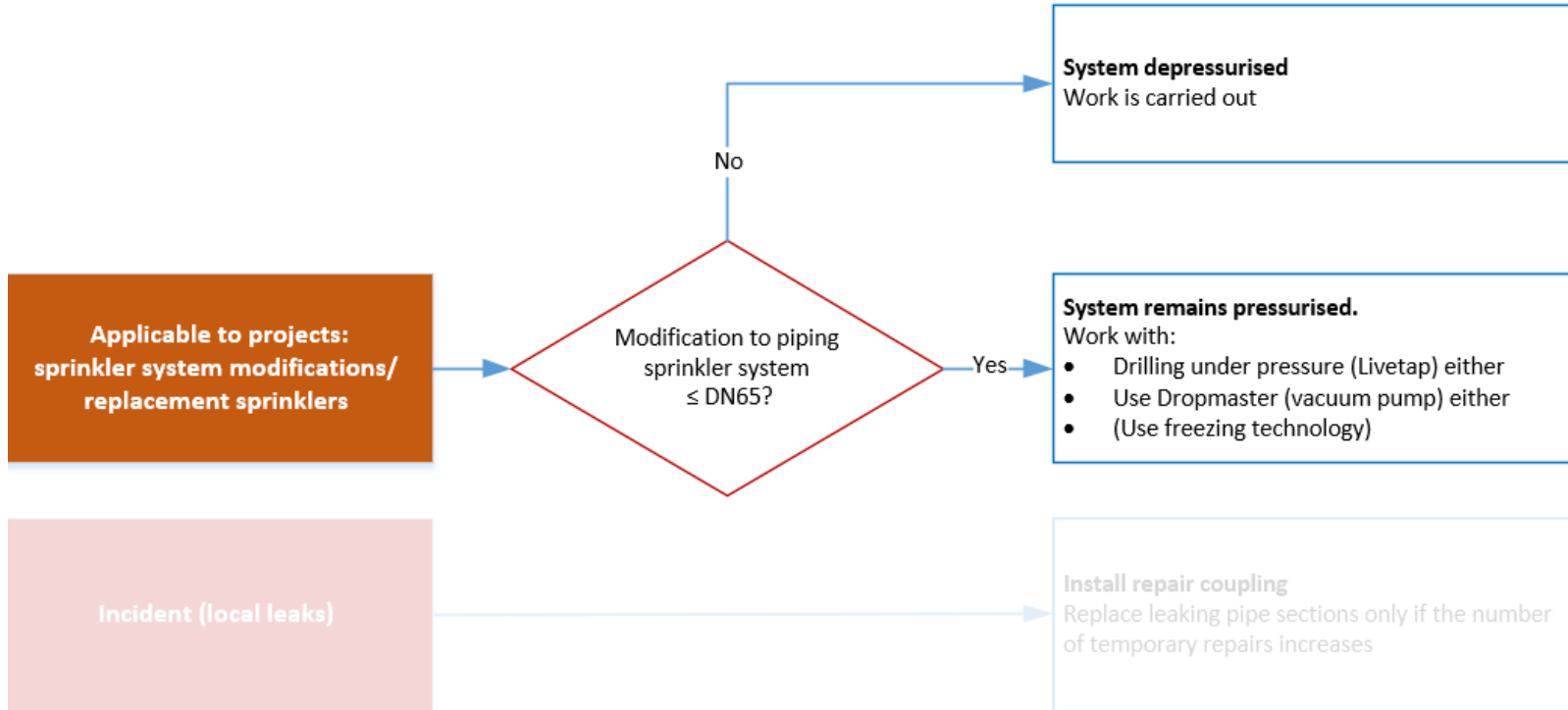
- ✓ Many sprinkler systems have few or minor corrosion or fouling issues
- ✓ Mainly localized corrosion in piping, just below the waterline at the highest parts
- ✓ Sludge, especially in galvanized pipes and in lower end pipes
- ✓ Trash that should not be present in sprinkler systems



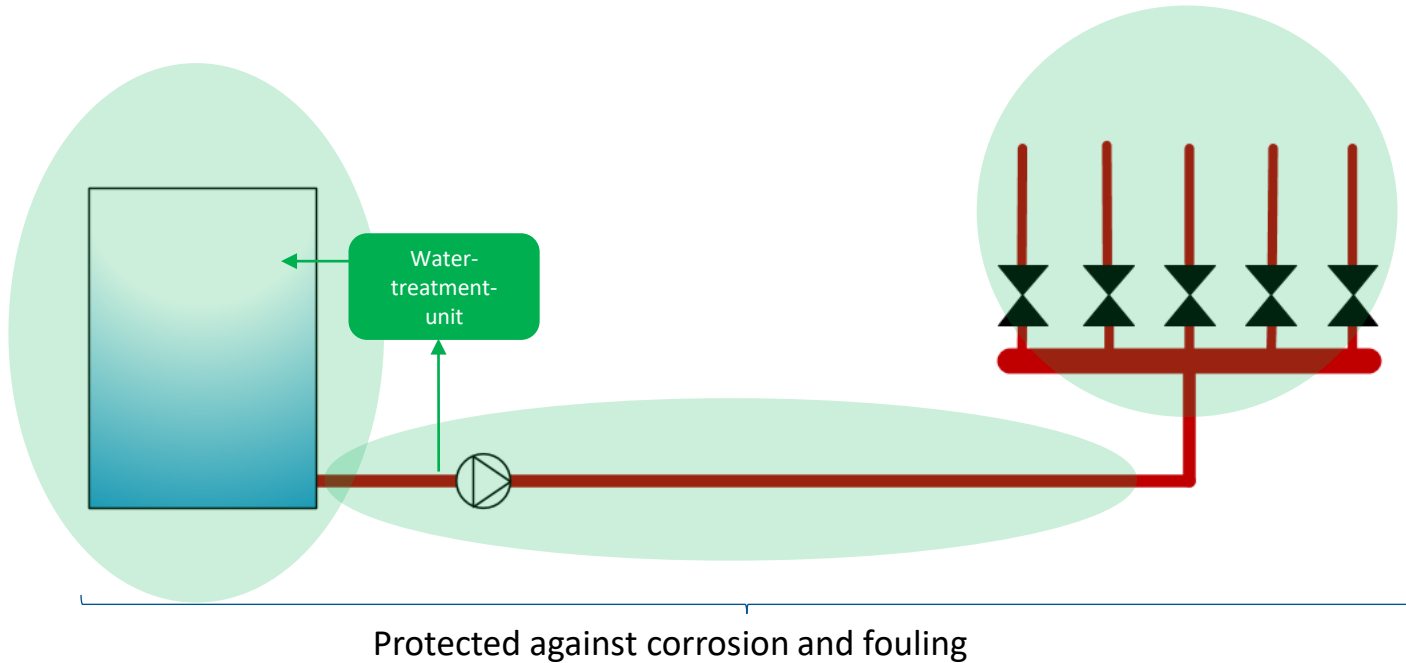
## Corrosion prevention



# Reduce water changes



# Advanced water treatment



## Opportunities to counteract corrosion

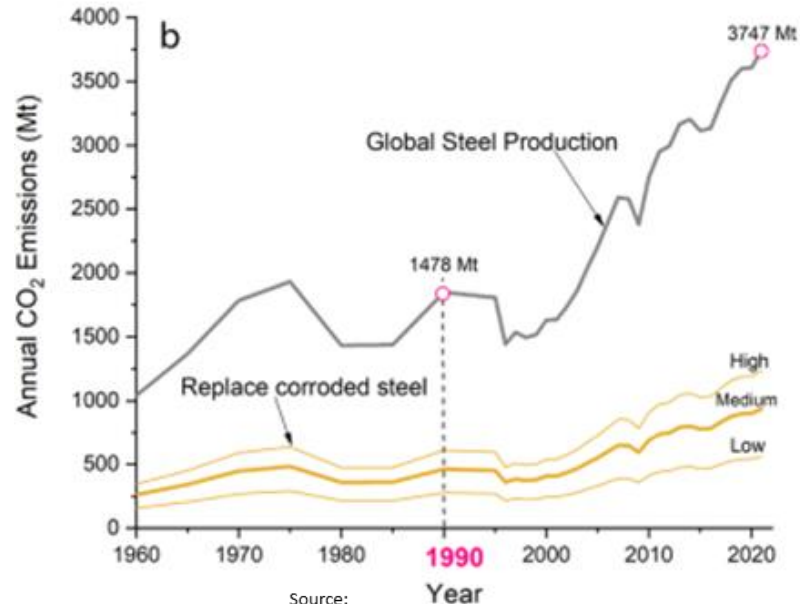
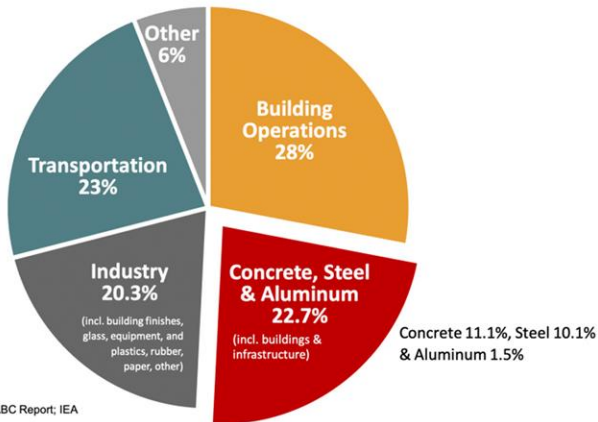
- ✓ Prevent/limit water changes during maintenance and during work on sprinkler system
- ✓ Water treatment/conditioning of water in the water supply
- ✓ Application of nitrogen in dry and wet sprinkler systems
- ✓ Corrosion-resistant piping (coating)
- ✓ Dosing chemicals/corrosion inhibitors
- ✓ Vacuum sprinkler systems

**Installation employees should be better instructed in cleaner operation**

# Sustainable operations sprinkler systems -1

- Producing steel is energy intensive. Realize that we cannot turn corrosion products into new pipes.

Global CO<sub>2</sub> Emissions by Sector



## Sustainable operations sprinkler systems -2

- ✓ We consider it normal to introduce water treatment in hot water, cooling and steam systems to prevent corrosion and deposits.  
However, we are surprised when things go wrong in sprinkler systems without additional measures.
- ✓ Sustainability within sprinkler systems means that we should treat our material sustainably and therefore reduce corrosion as much as possible.



# Preventing corrosion and contamination ensures reliable sprinkler systems and fire prevention. Don't accept corrosion, do something about it.

Mascha van Hofweegen

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