



# A light sprinkler standard?

Fire safety in parking garages has been a hot topic within the world of fire safety for decades. Fire fighting in car parks by the fire brigade is not always easy and a number of major fires have made it into media. Developments in vehicle technology over the past few years, such as EV vehicles, have not reduced these discussions. The ‘severity’ of the technical and maintenance requirements is often an obstacle to the installation of a sprinkler (or water mist) system in garage facilities. Here Ronald Oldengarm and Johan Hoogeweg, both Fire Safety Consultants with DGMR, explore the problem areas and look at possible solutions.

An important question that concerns us as consultants is: Can we be satisfied with a simple design of the sprinkler protection? A general rule is that if something can be done more simply (read cheaper), the chance that an installation will be realised is greater. Would we rather have 10 simple installations that provide a basic level of safety or two installations that provide maximum protection? In this article, we explore the problem areas and look at possible solutions.

## Challenges

In practice we see that especially for small car parks (<2.500 m<sup>2</sup>) the following challenges that lead to them not being equipped with a sprinkler system:

1. High costs for realising a water supply and pump room; often a supply from the water mains is not possible. A dedicated water storage in the building is required.
2. High costs for realising a monitoring system and fire brigade panel

3. High maintenance costs (e.g. every 1-2 weeks a check)
4. 3rd party inspection (annual)

For small installations, the general costs (1+2) have a large influence on the price per m<sup>2</sup> of an installation. If we can make these aspects more attractive, we will have a much better chance of realising more installations, protecting more buildings and increasing the overall safety level of where we live and work.

## Sprinkler standards

One of the biggest factors influencing costs is the required water capacity. This affects all parts of the plan (tank, pumps, pipes). The figure opposite shows the indicative required water capacity, taking into account the most common design standards, for a wet sprinkler installation\* in a car park.

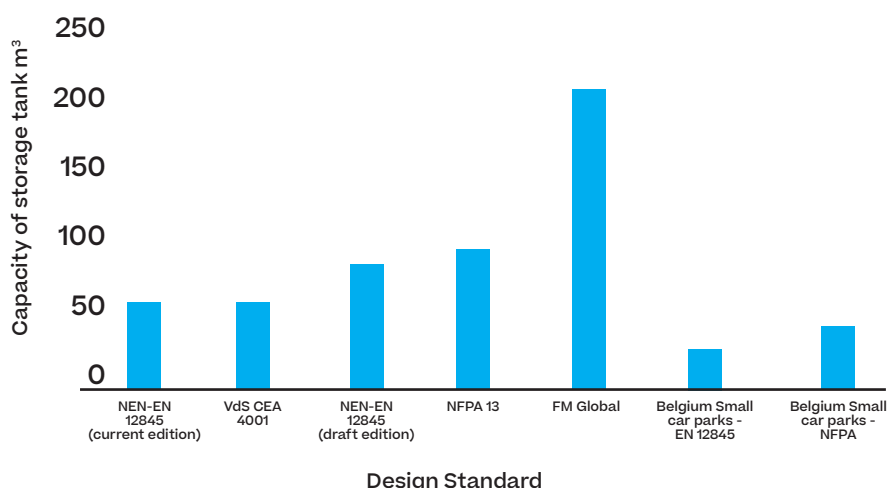
The water requirements of a sprinkler system as given in the design standard are based on fire testing (worse case fire scenario) and experience, combined with a safety factor. This results in a system with a high degree of reliability, and confidence that it can control the fire in all circumstances. For a situation where the failure of the sprinkler system could lead to major consequences, this is what is wanted.

## A practical solution?

Because a fire in most cases doesn't develop as a worst case scenario we see that usually not as many sprinklers are activated as assumed in the hydraulic design. Most fires are controlled with far fewer sprinklers (1-4). So, can we simplify the fire sprinkler system? In most cases the system will (partly) suppress the fire and give support to the fire brigade. Some thoughts about what is possible:

- Reduce the design area to fewer sprinklers, for example four sprinklers... Reduce the safety margins.
- Reduce the water delivery time to 30 minutes. In most situations the fire brigade will be there and can quickly extinguish the fire.
- If the latter is not possible the fire brigade can add extra water to the system through the fire department connection
- Do not install a monitoring system and fire brigade panel; just a flow alarm connected to a remote monitoring station.
- How can the inspection and maintenance requirements be optimised? Which are the critical parts and which parts can accept less frequent attention?

In Belgium, for example, a new system has recently been introduced in the Building Code (HR 1632 N R3 Parkings) Here, a short spray time and a lower hazard class for small car parks may be applied. This development is already a good step in the right direction.



Another way to see this concept is as a system that suppresses the fire when only one car is involved, preventing further spread of the fire to adjacent cars with only a limited number of sprinklers activated. Using a short spray time with the option for the fire brigade to supply water to the system after arrival further reduces tank size.

## Summary

In practice, we see that many parties involved are not opposed to the realisation of a sprinkler system and certainly see it as an added value.

Due to the high costs of installation and then of maintenance, these installations are not

widespread in car parks. Our idea is that the number of car parks that will be equipped with a sprinkler system can be significantly increased if we have a 'light' sprinkler standard.

Yes, the level of performance of the systems will drop a bit; but is that bad? We would rather see more systems with a good average performance than one system that is very good.

We could also apply this system to, for example, small schools and shops that are not currently equipped with a sprinkler system.

Of course this requires the necessary research, discussions etc. to make this possible. Who will take this on with us?

\* When the car park is subject to low temperatures an antifreeze system or dry sprinkler system will be required (a dry system requires approximately 30% more water).