Sprinkler Statistics 2011 and 2012

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INTRODUCTION

This is the Sprinkler Statistics for 2011 and 2012 (published April 2014). This year the Sprinkler Statistics show once again the benefits of a certified sprinkler system. Certification is a guarantee that the sprinkler system operates as expected. 24 hours a day, 7 days a week a certified sprinkler system is ready to keep a fire under control or to extinguish a fire in its early stage.

Fire Safety

Fire in large, sometimes very risky, properties can, apart from a threat to life, entail enormous damage: direct fire and water damage to goods, machinery and building, but also consequential loss that puts continuity of business at risk. Think of trading losses by not being able to deliver goods on time, business delays (revenue loss), forced dismissal by downsizing of the workforce, etc.. Prevention of fire or minimizing the effects of fire is of utmost importance for each business. A certified sprinkler system is one of the best solutions for fire protection and fire safety.

Minimising loss

The Nederlands Instituut Van Register Experts (NIVRE) ('Association of Insurance experts') provides an inventory of big fires with a loss of € 1 million or more in their quarterly publication *'Overview of major fires'*. The direct loss from the 91 fires in 2011 still amounts to € 345 million. That is an average loss of more than € 3.7 million. The direct loss from the 120 fires in 2012 still amounts to € 365 million. That is an average loss of more than € 3.0 million.

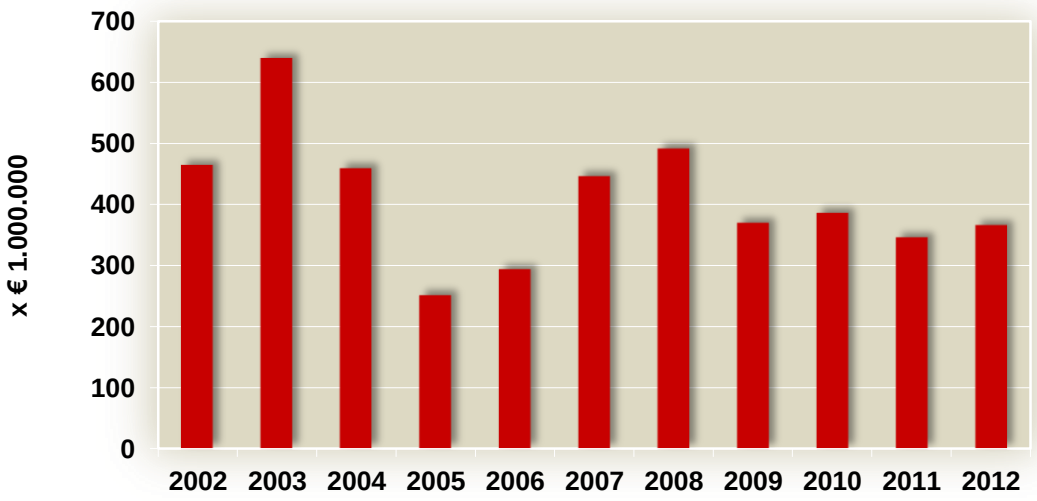
This statistics comprise a comparison with these large fires to show the loss minimizing effect of certified automatic sprinkler systems. After all, installation of a certified automatic sprinkler system would have been appropriate in these properties. This comparison shows that the average (known) loss from 27 fires in sprinklered properties in 2011 and 2012 will only be a fraction of the average loss in non-sprinklered buildings.
A summary of fires that occurred in 2010 in properties with a certified sprinkler system is also presented in this report.

Fire loss in properties, whether or not sprinklered

An overview of losses from € 1,000,000 in the period 2002 to 2012 follows below.
(Source: 'NIVRE': Overzicht grote branden, NIVRE)

Year	Total fire loss x € 1,000,000	Number of fires	Average loss x € 1,000,000
2002	462,600	96	4,82
2003	636,785	129	4,94
2004	458,200	84	5,45
2005	251,182	73	3,44
2006	293,234	79	3,71
2007	445,923	108	4,13
2008	490,659	96	5,11
2009	369,115	105	3,51
2010	385,000	100	3,85
2011	345,000	91	3,79
2012	365,100	120	3,04

Table 1: Fire loss (losses greater than € 1,000,000.--) in properties, whether or not sprinklered.



Graph 1: Total fire loss (losses greater than € 1,000,000.--) in properties, whether or not sprinklered.

Fire loss in sprinklered properties

14 Fires in sprinklered properties were reported to CIBV in 2011. 13 Fires were reported in 2012. In 12 (2011) and 11 (2012) of theses fires the sprinkler system extinguished, suppressed or controlled the fire. The losses for most of those fires are unknown.

From the description of the fires on the following pages can sometimes obtained an impression of the loss. The losses seem to be only a fraction of the losses listed in Table 1 and Graph 1.

Given that the loss is often unknown, in this version of the sprinkler statistic the sums and averages are no longer displayed in a table and a graph.

Date/ Time	Property type	System type	Activated sprinklers	Estimation of loss (€)	Cause/ Comment
19-01 Time unknown	Production (cocoa factory)	Wet pipe	3	Unknown	On the top floor of a building has been a fire in which the roof extension was badly damaged.
18-02 Time unknown	Waste management company	Deluge	225 m^2	Unknown	In a steel container with waste a fire started during working hours. The starting fire was detected by the fire alarm and sprinkler section 12 was activated and extinguished the fire. The municipal fire brigade has been on site but it was not needed to get into action.
20-02 Time unknown	Penitentiary institution	Wet pipe	1	Unknown	Sabotage by an inmate, who has folded paper around the sprinkler and then ignited the paper.
28-02 11.30 hour	Plastics factory	Wet pipe	4	Unknown	Extruder
23-03 00:53 hour	Semiconductor manufacturing	Wet pipe	2	Unknown	Leakage production piping
30-03 16:00 hour	Warehouse	Wet pipe	0	Unknown	A light caught fire, through person alert and swift action of BHV's the fire was limited to one light bulb and extinguished with a fire extinguisher. There is no sprinkler activated.
01-04 21:15 hour	Railway tunnel	Deluge	3 secties	Unknown	Train stopped in tunnel; line detection detected a fire.
16-04 21:15 hour	Plastics factory	Wet pipe	1	Unknown	Pollution of a discharge duct
15-05 Time unknown	Waste management company	Deluge	1 sectie	Unknown	Due to heat in the waste vault a fire started. As precaution, the deluge system and the fire monitors are activated.
25-08 Time unknown	Plastics factory	Wet pipe	3	Unknown	Static charge in mixer when filling. Mixer now inerted with nitrogen. Authorities endorsed protection action taken.
01-11 Time unknown	Shopping center	Dry pipe	2	Unknown	Arson. After the ATM attack the car was set on fire.
05-11 Time unknown	Penitentiary institution	Wet pipe	1	Unknown	Sabotage by an inmate.
06-12 07:00 hour	Dairy industry	Wet pipe	2	Unknown	Not knownn
13-12 Time unknown	Waste management company	Dry pipe	6	Unknown	Chemical reaction between chemicals

Table 2: Overview of fires in sprinklered properties in 2011.

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Overview of 2012 fires in sprinklered properties

Date/ Time	Property type	System type	Activated sprinklers	Estimation of loss (€)	Cause/ Comment
01-01 07.00 hour	Shopping center	Wet pipe	8	Unknown	The sprinkler system has been in operation for half an hour so that a large part of the mall has had water damage. The restaurant has been closed and is no longer usable.
17-01 14:00 hour	Biomass Power Plant	Wet pipe	2	€ 75.000,--	Fire in the engine of an excavator; 2 sprinklers activated at a height of + / - 15 m with a fire at + / - 2m height. Fire was controlled and the fire department extinguished the fire. Sprinkler has worked well.
07-02 Time unknown	Potato flour factory	Wet pipe	3	Unknown	There was an uncontrolled exothermic reaction in a reactor, so it came out in the end through a rupture disk. As a result, three sprinklers were activated. These sprinklers controlled the fire.
06-03 17.30 hour	Fire Station	Wet pipe	1	Unknown	Dryer. The sprinkler protection functioned properly.
07-08 Time unknown	Waste management company	Monitors	1 monitor	Unknown	Exothermic reaction in waste. Fire extinguished using one roof monitor
09-08 Time unknown	Coffee roasting factory	Wet pipe	5	Unknown	There's been a fire (originated in filter box). The system has controlled the fire.
15-08 Ca. 18.00 hour	Paper recycling	Wet pipe	5	Unknown	Paper in sorting machine ignited by friction. Machine 1 week off, rest stayed working
28-08 12.00 hour	Wood processing industry	Dry pipe	6	Ca . € 12.500,--	After cleaning cutting tool. Fire department called and extinguished the fire.
7-09 Time unknown	Waste management company	Wet pipe	5	Unknown	Exothermic reaction caused a fire in a heap. It mainly processes construction waste. The sprinkler system was activated in time and the fire department alarmed. The sprinkler installation extinguished the fire.
21-09 10:30 hour	Warehouse	Wet pipe	0	Unknown	When operating the emergency start the switching element clung which kept the starter energized. Due to the heat the underlying wiring was ignited. The resulting flames were extinguished with a fire extinguisher.
06-11 14:31 hour	Brewery	Wet pipe	1	Unknown	In the filling machine a fire is started in a crate by an unknown cause, the empty crate is placed by the automatic stacker on a pallet with empty crates. This pallet is then put on the monorail on the way to the empty packaging warehouse. The melting of the crates activated the load sensor and the monorail was stopped.. This has given enough heat build-up to the roof to activate the ESFR sprinkler
27-11 15:38 hour	Paper Mill	Wet pipe	3	Unknown	A fire started in the dust around the machine at the welding procedure. Business interruption a day.
Unknown	Waste management company	Dry pipe	2	Unknown	Unknown

Table 3: Overview of fires in sprinklered properties in 2012.

Leaks in sprinkler systems

52 leaks in sprinkler systems were reported to CIBV in 2010 and 91 leaks in 2012. The leaks can be categorized as follows.

Cause of leak	Leaks			
	Number 2011- 2012	Percentage 2011- 2012	Average Number /year 2008- 2012	Percentage 2008-2012
Corrosion	38	26%	30	41%
Frost	17	12%	8	11%
Mechanical damage	69	48%	24	33%
High system pressure	0	0%	0,2	1%
Installation and/or material defects	0	0%	1,2	1%
Overheating	5	4%	1,6	2%
Vandalism	1	1%	0,2	1%
Unknown causes	13	9%	7,4	10%
Total	**143**	**100%**	**72,6**	**100%**

Table 4: Leaks in sprinkler systems.

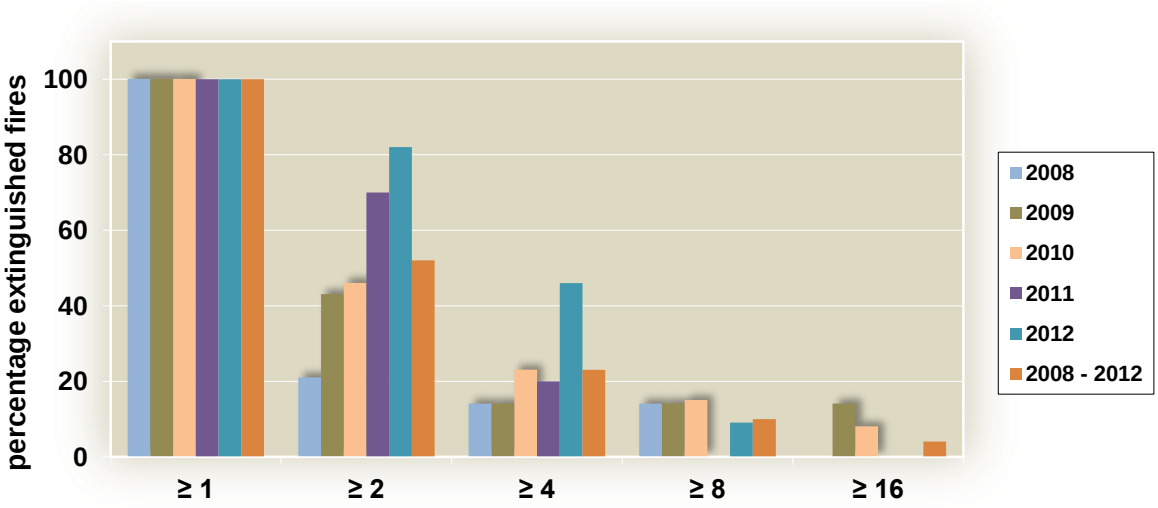
Based on 10 million sprinklers installed in the Netherlands, the chance of a leak is less than 1 in 100 000 (10^{-5}) per installed sprinkler per annum.

Effectiveness of sprinklers
All reported fires in registered sprinklered properties in 2011 and 2012 have been extinguished.

Graph 2 and Table 5 below show the effectiveness of sprinkler systems in 2008 to 2012.

Number of sprinklers	Percentage 2008	Percentage 2009	Percentage 2010	Percentage 2011	Percentage 2012	Percentage 2008 - 2012
≥ 1	100 %	100 %	100 %	100 %	100 %	100 %
≥ 2	21 %	43 %	46 %	70 %	82 %	52 %
≥ 4	14 %	14 %	23 %	20 %	46 %	23 %
≥ 8	14 %	14 %	15 %	0 %	9 %	10 %
≥ 16	0 %	14 %	8 %	0 %	0 %	4 %

Table 5: Number of activated sprinklers as a percentage of the total number of fires by CIBV/VIVB registered sprinkler systems in 2008 to 2012.



Graph 2: Number of activated sprinklers as a percentage of the total number of fires by CIBV / VIVB registered sprinkler systems in 2008 to 2012.

Overview of installed sprinklers by certified sprinkler contractors in the Netherlands in the period 2004 to 2012

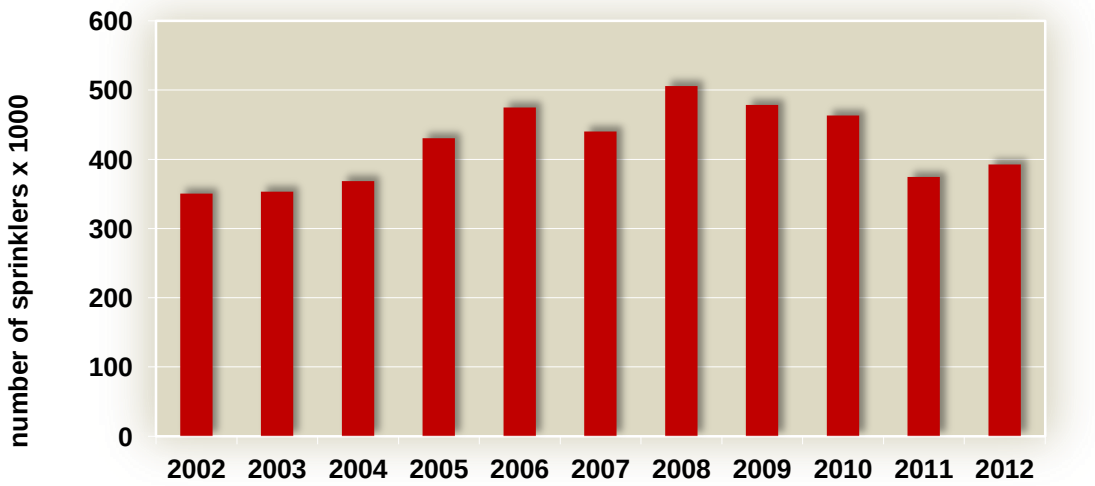
374,657 sprinklers have been installed in the Netherlands in 2011 (both new builds and renovations) by certified sprinkler contractors. In 2012 the number was 393,067.
The decrease in the number of sprinklers installed in 2011 (374,657) compared to 2010 (463,852) is approximately 19%.
The increase in the number of sprinklers installed in 2012 (393.067) compared to 2011 (374,657) is approximately 5%.

The total sprinklered area has increased by more than 4.6 million square meters in 2011 and 2012 when assumed that a sprinkler has an area of protection of approximately 10 m^2.

Table 6 and Graph 3 give an overview of the number of sprinklers installed in the period from 2002 to 2012.

Year	Number of sprinklers installed
2002	351,46
2003	353,778
2004	369,069
2005	430,673
2006	475,213
2007	440,418
2008	506,426
2009	478,716
2010	463,852
2011	374,657
2012	393,067

Table 6: Number of sprinklers installed in the Netherlands (2002 to 2012).



Graph 3: Number of sprinklers installed in the Netherlands (2002 to 2010).

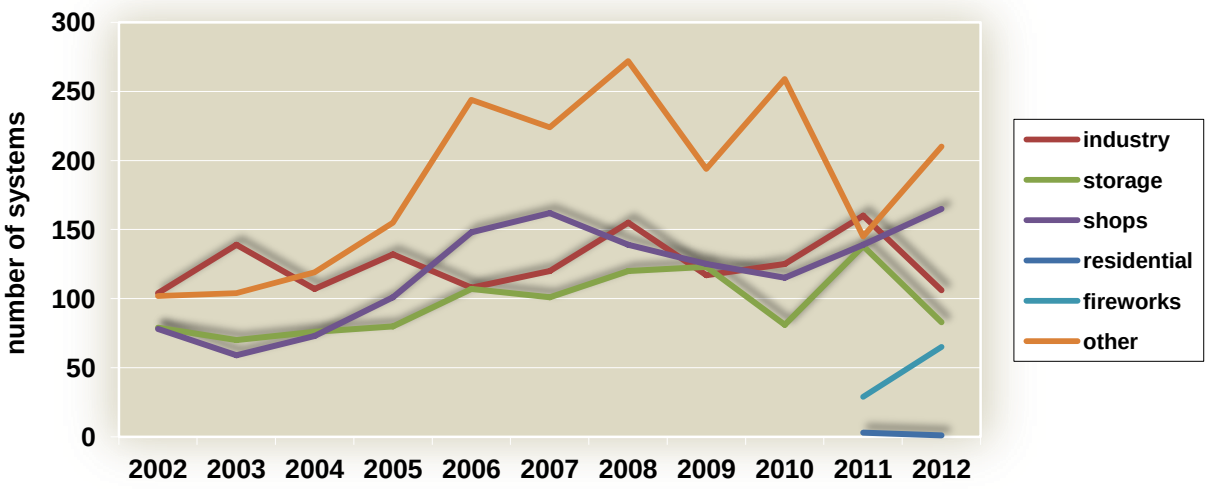
Breakdown of sprinkler systems installed in 2011 and 2012 in six categories

A breakdown of the number of installed sprinkler systems in 2011 and 2012 in the Netherlands, in six categories follows below.

Category	Number of systems		Percentage	
	2011	2012	2011	2012
Industry	160	106	26 %	17 %
Storage buildings	138	83	22 %	13 %
Shops	139	165	23 %	26 %
Residential	3	1	0 %	0 %
Firework storages	29	65	5 %	10 %
Other (office buildings, hotels, and the like)	145	210	24 %	33 %

Table 7: Breakdown of the number of sprinklers installed per category (2011 and 2012)

In the Graph below the data from 2002 to 2012 is displayed. From 2011 residential systems and firework storages are displayed apart.



Graph 4: Breakdown of the number of sprinklers installed per category (2002 to 2010)

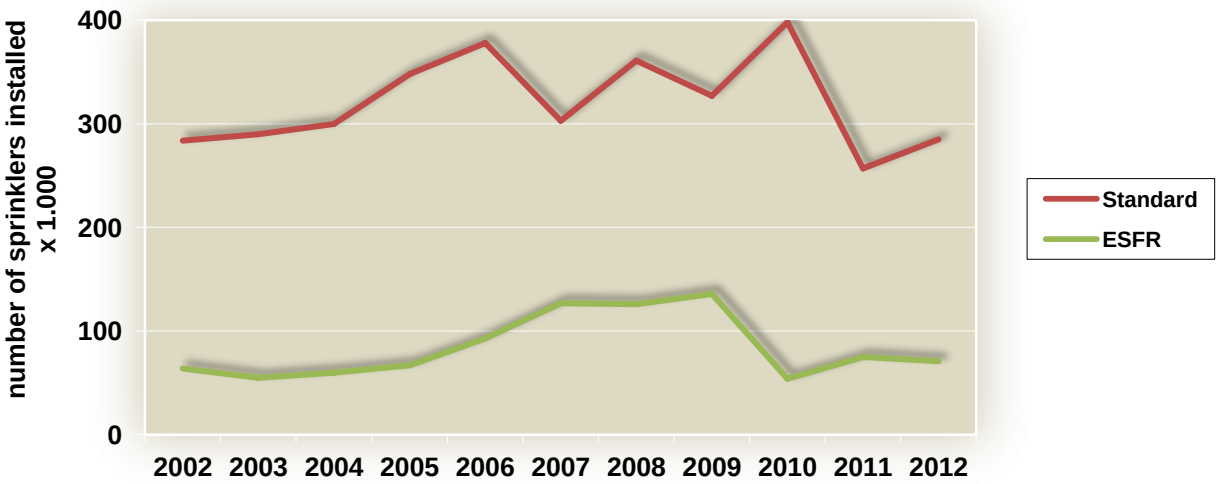
Sprinkler types

Sprinkler systems can comprise different sprinkler types. Sprinklers installed are categorized as standard sprinklers, ESFR sprinklers, CSMA sprinklers, residential sprinklers, controls, nozzles and replacement sprinklers. Tanle 8 shows the breakdown of the number of installed sprinklers per sprinkler type.

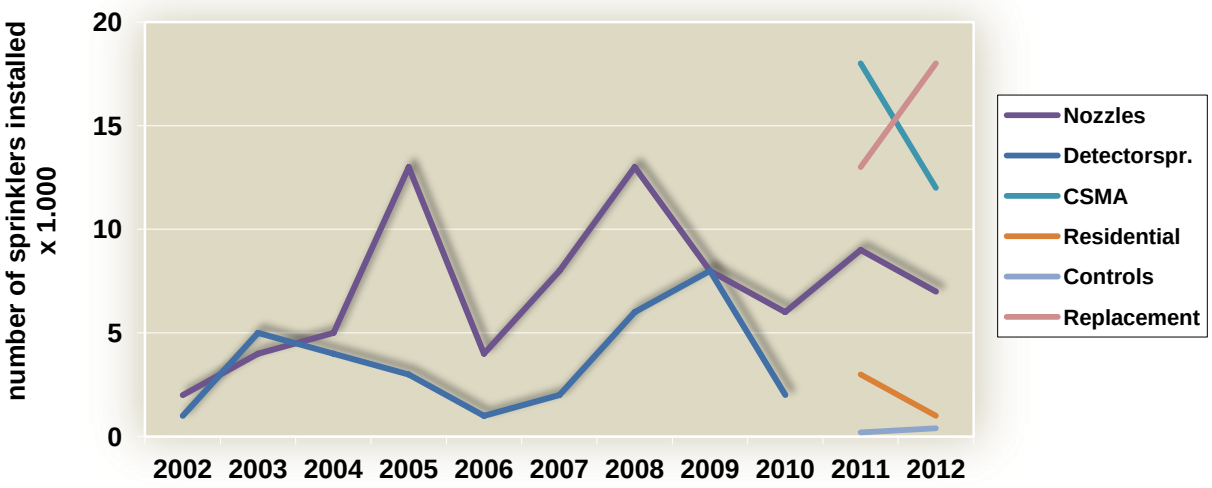
Types	Number of sprinklers		Percentage	
	2011	2012	2011	2012
Standard sprinklers	256856	284619	69 %	72 %
ESFR	75144	71025	20 %	18 %
CMSA	17639	11553	5 %	3 %
Residential sprinklers	3110	985	0,8 %	0,3 %
Controls	156	398	0,04 %	0,1 %
Nozzles	9096	6591	2 %	2 %
Replacement sprinklers (all types)	12656	17896	3 %	5 %

Table 8: Breakdown of sprinklers installed per sprinkler type (2011 and 2012) x 1000

Graph 5 and 6 shows the breakdown of the number of installed sprinklers per sprinkler type. Starting 2011 CMSA sprinklers, residential sprinklers, controls, nozzles en replacement sprinklers are displayed apart and detector sprinklers are not displayed anymore.



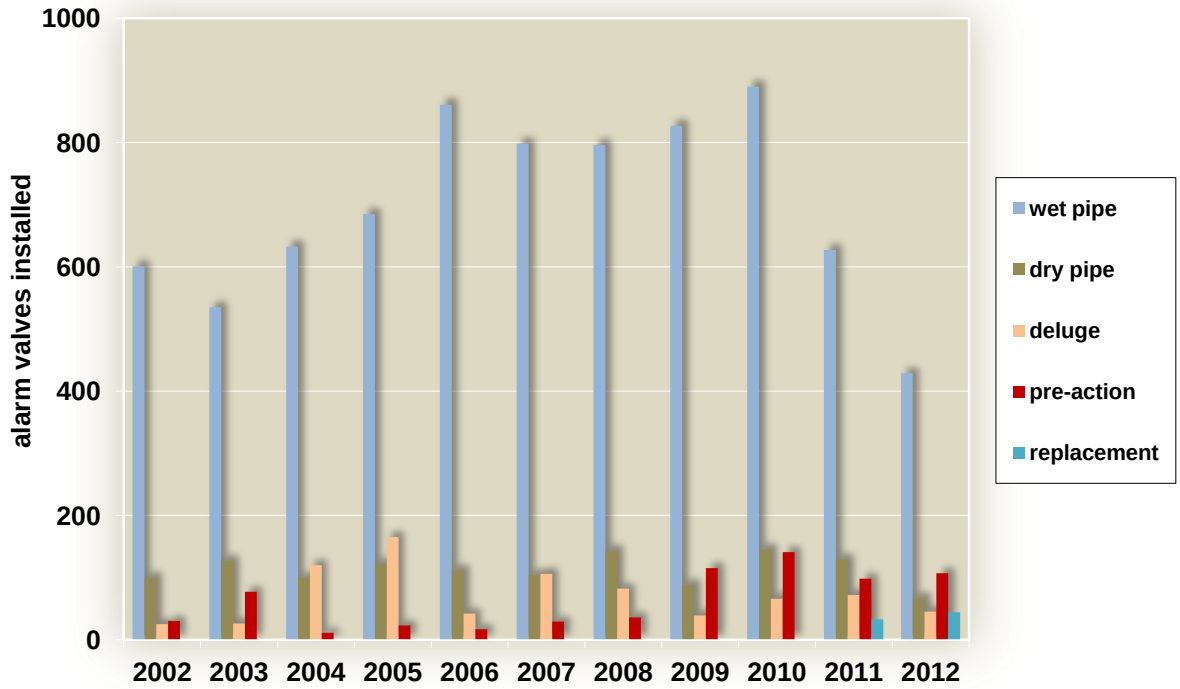
Graph 5: Breakdown of sprinklers installed per sprinkler type (2002 to 2012) x 1000



Graph 6: Breakdown of sprinklers installed per sprinkler type (2002 to 2012) x 1000

Sprinkler system types

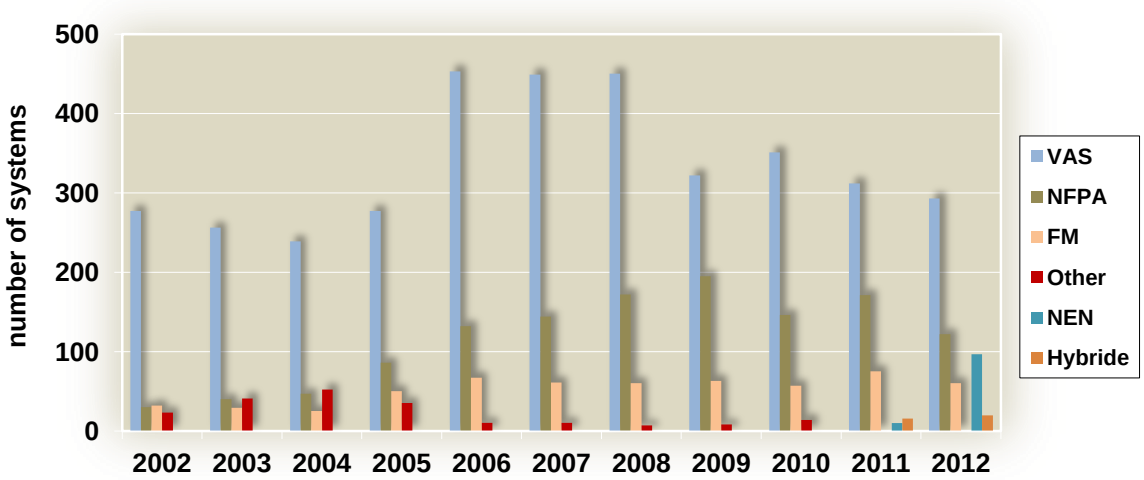
Most sprinklers are installed in wet pipe sprinkler systems. Graph 7 shows the breakdown per sprinkler system type in the period from 2002 to 2012.



Graph 7: Breakdown per sprinkler system type

Applied sprinkler standards

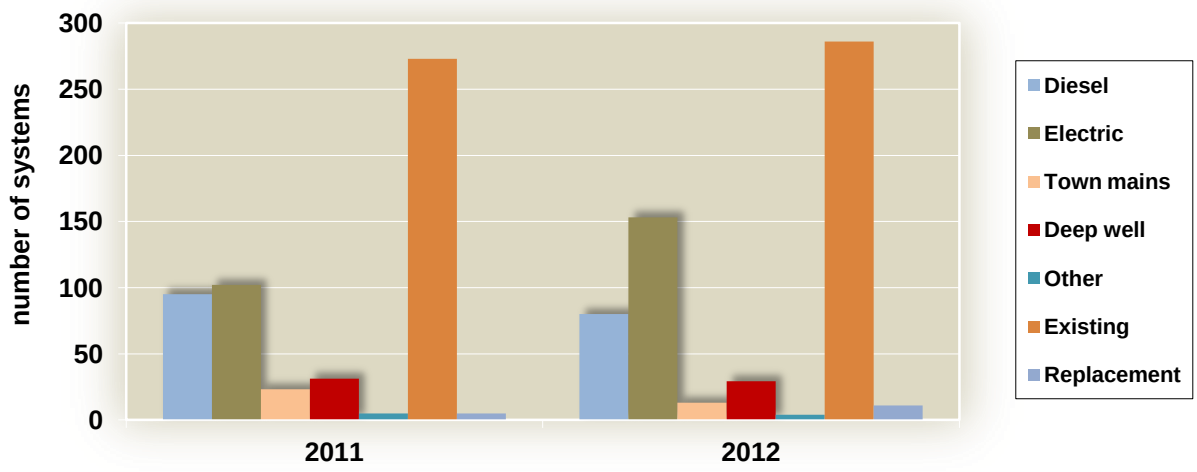
Dutch sprinkler standards (VAS or NEN 12845+NEN 1073), international sprinkler standards (NFPA / FM, etc.) or a combination (hybride) are applied as a starting point for design, installation, management and maintenance. Graph 8 shows the breakdown of the number of sprinkler systems in the Netherlands per standard.



Graph 8: Applied sprinkler standards in the Netherlands.

Sprinkler system water supply

Sprinkler systems can be equipped with Diesel engine drives, Electric motor drive, connected to the town mains or a deep well. Sprinkler systems can be connected to an existing water supply or a new water supply can replace an existing water supply. Graph 9 shows the breakdown of the sprinkler system water supplies in the Netherlands. The data are collected since 2011.



Graph 9: Water supplies for newly installed sprinkler systems in the Netherlands.

