
Limiting the production of smoke

There is no doubt that in many instances' sprinklers are able to control the spread of fire and in some cases, extinguish it completely. They are able to prevent fire damage and spread to adjacent areas but sprinklers can struggle with slow activation times for fires with a slow growth rate and provide limited benefit for smoke control. The studies below highlight this limitation:

- [The Fire Column by Paul Hanson](#)

Conclusion – page 4

'Sprinklers have the ability to reduce the heat output from a fire by containing its growth, however the main problem for means of escape is smoke. Sprinklers have been shown to reduce overall smoke toxicity, however for the critical period when persons need to escape this reduction is not sufficient to maintain tenable conditions. In some cases the time for smoke toxicity to reach a critical level is not very different from an unsprinklered fire. Therefore, sprinklers are not a suitable alternative to a protected route.'

- [Efficiency and Effectiveness of Sprinkler Systems in the United Kingdom](#)

Incidence of Deaths and Injuries in Sprinklered Buildings: A Supplementary Report March 2019 - page 15

'A study of these fatal dwelling fires, where sprinklers were present, found that the circumstances of the fire fell outside the life-saving operating parameters of the system's design. Typically the casualty was directly involved in the fire with either their clothing or bedding ignited - often by smoking materials. Typically, they were also unable to move away from the fire or remove clothing due to mobility issues. Often they were medically more likely to succumb to burns or smoke inhalation due to age or infirmity. More work is needed to design systems that are specifically required and installed to protect those who are both vulnerable and at greater risk than the general population.'

- [The causes of fire fatalities and serious fire injuries in Scotland and potential solutions to reduce them](#)

Briefing Paper - Phase 1: IRS review, page 3

'More needs to be done in terms of reliable early detection and suitable intervention, to either delay the development of the fire or to notify people – using technology – so they can take suitable action at the early stages of the fire..'

- [Investigation of Residential Cooking Fire Suppression Technologies](#)

NIST Technical Note 1969 – page 48

'Neither room protection system tested (glass bulb activated water sprinkler and mist) could provide suppression without producing some hazard to occupants. This is partly due to the slower activation times of the room protection systems, which resulted in a larger fire prior to activation. The sprinkler system was able to delay the tenability limit in one test. In the second test, tenability became an issue after sprinkler activation.'

- [An appraisal of the ODPM - BRE Report “Effectiveness of sprinklers in residential premises”](#)

Fire Sprinkler Association – page 13

‘There was also no problem with the chip-pan fire, except that it was rather a small fire in a large room, and it was some time before it created enough heat to operate the sprinkler.’

‘The table fires, with a substantial fire load under the table obscured from the sprinkler discharge, proved a severe challenge.’

‘Toxic smoke build up was such in each sprinklered fire that occupants unable to escape themselves would need to be rescued in 2½ minutes to 12 minutes after the sprinkler alarm sounded.’

Table C -Experimental fires with sprinklers

Sprinkler tests	Alarm in room min s	External alarm min s	Sprinkler activation min s	Time to Unconscious min s	Time to death min s	Rescue time before death alarm in room min s	external alarm min s	sprinkler alarm min s	Possible death in room
TV fire									
8	3m 17s	3m 47s	8m 20s	no	no				no
7		13m 31s	23m 11s	20m 24s	25m 4s		11m 33s	1m 53s	yes
28	1m 24s		7m 11s	no	No				no
20		7m 10s	9m 14s	no	No				no
19	3m 17s	4m 27s	11m 53s	no	No				no
Table fires									
12	1m 2s	1m 47s	6m 36s	6m 53s	9m 10s	8m 8s	8m 13s	2m 34s	yes
14	34s	1m 52s	2m 59s	5m 56s	8m 49s	8m 15s	6m 57s	5m 50s	yes
17	37s	1m 15s	1m 58s	6m 58s	11m 10s	10m 30s	9m 52s	9m 9s	yes
22	22s		2m 25s	9m 46s	14m 38s	14m 16s	13m 36s	12m 13s	yes
24	57s		1m 35s	7m 49s	11m 30s	10m 33s	11m 1s	9m 55s	yes
Sofa fires									
9		12m 29s	no op	no	no				no
10		12m 18s	14m 26s	21m 37s	no				no
Bed fires									
15		3m 10s	5m 3s	no	no				no
13			2m 36s	no	no				no
Oil pan fires									
27	7m 29s		20m 2s	no	no				no
29	18s		22m 16s	no	no				no

We developed [Automist Smartscan](#) because we believed they could be better: operate faster, be more reliable and cause less water damage. One of our key design objectives is to maintain tenable conditions in the room of fire origin by limiting the build-up of smoke as well as heat. Automist raises the alarm early and can tackle some fires up to 2 minutes before traditional sprinklers.

Watch a video of it in action vs sprinklers:

- 1) Shielded fridge fire - <https://www.youtube.com/watch?v=ZLapfcyAQ8>
- 2) Oil fire - <https://www.youtube.com/watch?v=mElKtkc6hyM>