bafsa

Information File

Sprinklers in Dwellings

November 2008
Issue 2
BIF No 2

Studley Green, Wiltshire, 212 properties ranging from 1 person flats to 8 person homes - all were fitted with domestic fire sprinklers at construction stage.

Introduction

Each year in the United Kingdom the Fire & Rescue Services attend approximately 60,000 fires in dwellings. These fires kill over 400 people and injure a further 12,000[1] annually.

For each day of the year therefore, a life is lost and over thirty people injured as a result of fire in, what is often, their own home.

The last 10 years has however, seen a pleasing downward trend in the number of fire related casualties but the figure remains unacceptably high. The elderly, the very young (under 5s), disabled and – it has to be said, those affected by drugs and/or alcohol – are the people who primarily feature in this grim annual tally. In addition, the British Crime Survey (BCS) estimates that the Fire & Rescue Services attend only one-fifth of all dwelling fires and the actual number of fires in dwellings is approximately 320,000 each year - or almost 900 per day!

Sprinklers for Life Safety

While fire sprinklers have been successfully used for the protection of property such as factories, department stores and shopping centres for well over 130 years (fire sprinkler protection is certainly not a new innovation), there is now a growing appreciation of their potential to save lives in other types of buildings – particularly our own homes where the majority of deaths from fire occur. For this reason, all Fire and Rescue Services support and encourage the use of residential fire sprinklers such as in Studley Green Wiltshire (see above) [2].

The latest version of 'Approved Document B' in support of the building regulations for England and Wales incorporates clear recognition of this approach following extensive research carried out by the Building Research Establishment (BRE).

Sprinkler Research

In February 2004 the BRE published the findings of a two and a half year study commissioned by the Office of the Deputy Prime Minister (ODPM) into the "*effectiveness of sprinklers in residential premises*"

Due to the limited number of sprinkler installations in the United Kingdom it was not possible to determine the effectiveness of sprinklers solely on the UK fire statistics, so the research included a review of residential sprinkler experience from other countries. The general agreement for sprinkler and smoke alarm effectiveness in other countries was as follows.

Alarms only: Reduced deaths by 53% and injuries by 70%.

Sprinklers + Alarms: Reduced deaths by 83% injuries by 45-85% and property loss by either 40-50% or 85%

[1] Source - Annual Fire Statistics ODPM 2005

[2] Refer—BAFSA website for more information

The result of not fitting a sprinkler! (Photo courtesy of Northamptonshire Fire & Rescue Service)

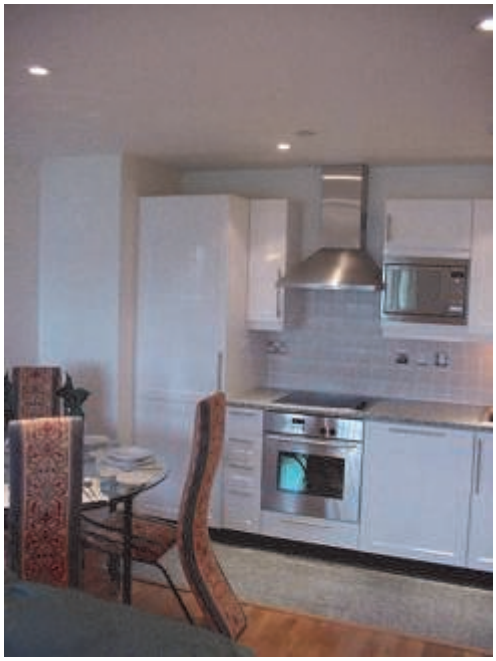
Whilst statistics can provide valuable data to aid decision making, the experience of real fires – or at least, realistic fire testing of materials and products - provides the most valuable information. For this reason a number of experiments were carried out by the BRE as part of the study.

Experimental Programme

Eight sprinklered and un-sprinklered lounge fires, using realistic fuel, were conducted inside a 2 storey detached house of traditional design, with loft conversion. Key findings included:

- Sprinklers operated after about 7 minutes from ignition
- The sprinklers controlled all the fires and most were extinguished.
- With sprinklers, the fire gasses were cooled sufficiently that the occupants of the room of origin would not have experienced extreme pain due to convected heat.
- In all of the sprinklered fires, death would not have occurred

These results support the growing evidence available worldwide which shows that while sprinklers are primarily intended to contain or



Concealed sprinkler heads are almost invisible

control fires, in a number of cases, people in the room of origin of a fire have survived as a result of the effectiveness of the sprinkler system.

'There are no cases on record where multiple fire deaths have occurred in buildings with working fire sprinkler systems'

How do Sprinklers Work?

Water may be supplied to an automatic sprinkler system direct from a service main water supply. However, in areas where the mains cannot provide sufficient pressure and/or flow then it is necessary to install a small pump and water tank providing a minimum of 10 minutes supply.

The sprinkler heads are connected to the water supply via a series of pipes which are

WHAT SPRINKLERS WILL DO

Detect a fire

Raise the alarm

Extinguish or control a fire

IMMEDIATELY PROTECT LIFE AND PROPERTY

And do so 24 hours a day, 365 days a year.

Successful Sprinkler Stop - Kensington Walk, Trowbridge, Wiltshire

Kensington Walk—Inside

Outside

distributed throughout the protected building.

The pipes, which are no bulkier than the pipes used for the buildings water supply, can be concealed within ceiling voids or roof spaces.

Each sprinkler has its own heat detector and operates at a predetermined temperature; normally 68°C and the sprinkler heads can be concealed and made totally unobtrusive.

Cost of Sprinklers

The BRE research found that the average costs of sprinklers were:

- Typically 1-2% of total construction costs.
- Typically equivalent to £1,000 - £2,000.(in new build)
- Trade off and other savings may recoup the installation costs. In addition, annual maintenance costs of systems can be as little as £50-£80

Standard for Installation

Residential sprinkler systems should comply with British Standard BS 9251:2005 'Sprinkler systems for Residential and Domestic Occupancies – Code of Practice' [3].

Benefits for Designers and Builders

One of the most often ignored benefits of residential and domestic fire sprinklers is the additional flexibility a system can provide to architects and developers. Increasingly popular is the utilisation of sprinklers to compensate for reduced levels of structural fire protection (e.g. walls and fire-doors) thus allowing for open-plan designs in three-storey developments and loft conversions.

Sprinklers have also provided a solution to problems caused by restricted Fire Service access to buildings and satisfied the Building Regulations requirements

A fire sprinkler stopped this fire in its tracks. The occupants did not require re-housing whilst minor repairs and some re-decorating returned this home back to normal.

Some projects have even reported that this approach has resulted in cost savings.

The American Experience, Scottsdale Arizona.

In June 1985 and 1986 the City of Scottsdale (population 175,000) introduced laws requiring all new commercial, multi family and domestic premises to be sprinkler protected.

This decision was only taken after a series of live fire tests which showed conclusively that the fire sprinklers would indeed protect life and property.

In 1997 the 'Scottsdale Report' was published indicating that during the 10 year period

- 8 lives were saved
- Average loss per sprinklered fire = $1,945
- Average loss per non-sprinklered = $17,067

[3] Refer - BAFSA Technical Guidance Note No 1 Design and Installation of Residential & Domestic Systems

- 65% of residential properties are now sprinklered and 85% of commercial properties are now sprinklered
- Most importantly there has been no loss of life in any sprinklered building.

Facts about Fire sprinklers:

- **US experience shows that 98% of all fires in sprinklered dwellings are extinguished with only a single head operating.**
- **Only the sprinkler head in the immediate vicinity of the fire actually operates**
- **Sprinkler heads can be almost completely concealed**
- **Sprinkler systems do not need pumps and tanks if the mains pressure is adequate.**
- **Sprinklers do not "false alarm", they will only operate if there is a fire.**
- **For a small additional cost, an alarm switch can be built in to call the Fire Service automatically if the sprinklers operate.**
- **Maintenance costs are low - less than £100 per year.**

The City of Scottsdale has shown that there can be both economic and life safety benefits arising from the installation of a sprinkler system [4].

System Design and Installation

While there is nothing mysterious or complicated about fire sprinkler systems, their high reliability and effectiveness has come about over many years by strict adherence to sprinkler design rules and design standards. The Sprinkler Co-ordination Group estimates that in excess of 20,000 homes are being sprinkler protected every year. It would therefore be wise to always select a contractor who is not only competent but has an established track record and can offer proof of compliance with membership of an established third party certification scheme.

Most BAFSA members have been in business for more than ten years and some for more than thirty – all can provide proof of their competence.

[4] Visit - http://findarticles.com/p/articles/mi_qa3737/is_/ai_n8928360

Presented by:

bafsa

British Automatic Fire Sprinkler Association Ltd
Richmond House • Broad Street • Ely • CB7 4AH
Telephone: 01353 659187 Fax: 01353 666619
Email: info@bafsa.org.uk Web Site: www.bafsa.org.uk

Copyright © 2008 BAFSA