



Home Fire Sprinklers Initiative

Following Grenfell Tower fire on 14th June 2017, the most serious and tragic fire in recent years, there are numerous calls for high-rise buildings to be retrofitted with sprinkler systems and for the building regulations to be reassessed.

When compared to older technologies, today's homebuilding materials offer a more economical and sustainable way of constructing new buildings. A less known fact is the dramatic way some of these new products or technologies could respond to fire. Grenfell Tower is an example how modern cladding technology had an impact on the fire spread. New homes are often built with lighter materials, have larger open spaces and furniture made of combustible materials. These new materials and technologies bring new fire challenges and can exaggerate fire spread and lead to homes burning more quickly. Smoke alarms are not enough, and home fire sprinklers are said to reduce the risk of death in the fire by 80 percent, while there is a 70 percent reduction in direct property damage. Office buildings, high-rise buildings, schools, care homes, hospitals, etc. should be retrofitted with fire sprinklers. Home fire sprinklers could also be installed in new one- and two-family homes.

Fire sprinklers reduce fire spread. All buildings constructed after 2007 and more than 30 metres (98 ft) high are required to be fitted with sprinkler systems. The British Automatic Fire Sprinkler Association (BAFSA) estimates that the cost of installing a system in Grenfell Tower would have been around £200,000. Costs are never too high when safety is in mind and leaks, or accidental activations are very rare. Moreover, according to research, the sprinklers reduce the water use to fight the fire and greenhouse emissions during house fires so smoke's density and toxicity.

A panel of experts during the FIREX International Expo agreed that building regulations must be reassessed as a part of the inquiry into the Grenfell Tower fire. According to Dennis Davis of the Fire Sector Federation (FSF), "the approved documents are falling behind what is going on within the built environment." It is believed that the cladding used at Grenfell Tower was non-compliant

with building regulations for high-rise buildings and that building inspections by council failed to address the issue. The Department of Communities and Local Government, which oversees building regulations, says: "Cladding using a composite aluminium panel with a polyethylene core would be non-compliant with current building regulations guidance. This material should not be used as cladding on buildings over 18m in height." It is believed that the cladding used at Grenfell Tower was non-compliant with building regulations for high-rise buildings.

What should builders know about the fire sprinklers?

Building Regulations- Refer to British Automatic Fire Sprinkle Association (BAFSA) at www.bafsa.org.uk According to Approved Document B of Building Regulations 2000 all new residential blocks over 30m high must be fitted with sprinklers. Similarly, an uncomparted area in a shop or self-storage building over 2000 square metres now require sprinkler protection. There are similar regulations applying to large single storey buildings for industrial or storage use where the largest permitted unsprinkled compartment is 20,000 square metres. Sprinklers system can be installed as a "trade-off" for building regulations compliance.

Types of Sprinklers

- **Wet pipe** - the most common systems used in buildings where there is no risk of freezing. Pipes are filled with water which is above the sprinkler heads and can be activated immediately. Wet systems are required for multi-storey or high-rise buildings.
- **Alternate** - alternate systems can have the pipes full of water for the summer months and be drained down for the winter, what is important for buildings that are not heated.
- **Dry pipe** - pipes are filled with air under pressure at all times and the water is held back by the control valve. When a sprinkler head opens, the drop in air pressure opens the valve and water flows into the pipework and onto the fire.
- **Pre-action** - Like dry pipe systems the pipes are filled with air but water is only

let into the pipes when the detector operates (e.g. smoke detectors). Pre-action systems are used where it is not acceptable to have the pipes full of water unless there is a fire.

- **Deluge and recycling** - these are used for industrial risks.

Installation

Sprinklers are installed in the same way as plumbing, behind walls and ceilings. All areas of the building that require sprinklers protection is covered by the grid of pipes with sprinkler heads fitted into them at regular intervals. Sprinklers pipes are made of chloro-polyvinyl chloride (CPVC) or cross-linked polyethylene (PEX), a cost-effective, lightweight material. Copper pipe can also be used. There is a valve that can be used to shut off the system for maintenance. Sprinklers in residential and domestic occupancies should be installed in compliance with BS 9251:2005 Sprinkler systems for residential and domestic occupancies. Code of practice. (For more information on the application of BS 9251, refer to BAFSA Technical Guidance Document No 1). Where this standard is not appropriate, sprinklers should be designed and installed in accordance with BS EN 12845 2004 Fixed fire fighting systems. Automatic sprinkler systems. Design, installation and maintenance.

How sprinklers work

All home fire sprinklers operate in response to the high temperature of a fire, usually between 135-165 °F. Smoke or a smoke alarm signal cannot operate a fire sprinkler. Each sprinkler reacts to nearby high heat individually. Fire sprinklers do not flow water simultaneously unless multiple sprinklers are exposed to their activation temperature. The sprinkler nearest a fire will operate automatically while the fire is still small, controlling or extinguishing it (often before the fire department arrives). That fast response limits the spread of flames, heat, and poisonous smoke. In 90% of home fires, just one sprinkler is needed to control the fire. Little maintenance is required with periodic tests of the pump and water flow.

Skills requirements

There are specially designated courses and all installer members of the BAFSA can be recommended for sprinklers system installation.

Retrofitting Sprinklers

In September 2011, BAFSA funded a pilot project to install sprinklers in a Sheffield tower block, which proved that it is possible and cost-effective to retrofit sprinklers into an existing high-rise block without first having to relocate the tenants. Such installations can be undertaken on a fast track basis and the installation cost of £1,150 per flat compares favourably with other fire protection measures; Modern sprinkler are specially designed to meet the needs of architects in offices, hotels, shops, hospitals and prestige buildings. They are compact and elegant. In most buildings, the public is usually unaware that sprinklers are fitted. Miniature sprinklers are little bigger than a 50p piece and are neat and robust. They can be fitted with ceiling rosettes and painted to match any colour scheme. Concealed Sprinklers are recessed and

covered by a flat plate flush with the ceiling. They are unobtrusive and almost invisible. Concealed Sprinklers are ideal for clean areas, where there is restricted headroom or vandalism is a problem.

Benefits for Builders and Developers

Sprinklers increase the safety standards of the property and enable the Building Regulation compliance (escape requirements). Amongst incentives to install sprinklers are allowing more residential units, other exit provisions, travel distances, fire separation, access for fire and rescue services, access to the fire hydrant, longer dead ends, boundary conditions, etc.

(Source: British Automatic Fire Sprinkler Association)



