

PRESSING MATTERS

BREAKING THE BARRIERS
TO RETROFITTING SPRINKLER
SYSTEMS IN EXISTING BUILDING
STOCK

May 2018





I am delighted to write the foreword for this important document, "Pressing Matters, Breaking the Barriers to Retrofitting Sprinkler Systems in Existing Building Stock."

As the architect of the Domestic Fire Safety Measure, which means mandatory provision of sprinkler systems into all new home builds in Wales, I believe that this legislation adds to the 'toolbox' of fire safety measure that will lead to safer communities.

Often fire safety is seen as reacting to events rather than leading debate in order to avoid such dreadful tragedies and that is why a document like this is vital to keeping the conversation going and also offering learning experiences, building on those who have already taken steps to retrofit sprinkler systems into homes.

There can be no doubt that the installation of a sprinkler system offers a degree of security and protection of one's home and many precious memories, it has a good environmental footprint and also reduces the burdens on public sector funding. But above all, no one has ever died from a fire related incident where a sprinkler has been installed.

This document will play an important role in helping to educate, agitate and hopefully organise those who have it in their power to fit sprinkler systems into existing properties.



Ann Jones AM
Labour Assembly Member, Vale of Clwyd

THE BACKGROUND

Dany Cotton, Commissioner of the London Fire Brigade: "I'm staggered we don't have sprinklers in domestic premises and schools. They save lives. They keep people safe, as well as putting the fire out."

Ann Jones AM: "If the Lakanal House recommendations had been carried out and if there had been more emphasis put on the recommendation that tower blocks should be retrofitted with sprinklers then perhaps we wouldn't be seeing the (Grenfell Tower) tragedy that we've got."

London Assembly Planning Committee: "We are recommending that the Building Regulations should require all new residential buildings over 18 metres – six storeys - high, new care homes and sheltered housing be fitted with sprinklers immediately. We also call on the Government to require sprinklers to be retrofitted in every existing tall building, care home and sheltered housing block during refurbishment work."

National Fire Chiefs Council: "The NFCC support the concept of risk assessed retrofitting of sprinklers in existing buildings and would also welcome the prioritisation of a review of the Building Regulations (Approved Document B) to ensure fire safety requirements keep pace with new building developments."

Keith Wiseman, the coroner for the inquest into the deaths of two firefighters at Shirley Towers in 2010: "Social housing providers should be encouraged to consider the retrofitting of sprinklers in all existing high-rise buildings in excess of 30 metres in height."

Assistant Deputy Coroner Frances Kirkham following the Lakanal House tower block fire, which killed six people in 2009: "It is recommended that the DCLG encourage providers of housing in high-rise residential buildings containing multiple domestic premises to consider the retrofitting of sprinkler systems."

Terry McDermott, Chief fire officer of Derbyshire Fire and Rescue Service and chair of the National Fire Sprinkler Network: "Sprinklers are the most effective way of suppressing or extinguishing fire."

BAFSA: "Sprinkler retrofits can be done inexpensively without moving residents out."

SPRINKLERS SAVE LIVES: PUTTING A COST ON HUMAN LIFE

In June 2017, 71 people died and another 70 were injured in a fire in West London. It was Britain's worst fire in over a century.

Grenfell Tower was not fitted with sprinkler systems because fire safety laws at the time of the fire did not require it. A fire safety expert previously contracted to work on the tower later said that sprinklers would have stopped the fire from spreading and given residents a "99 per cent chance of survival."

Dany Cotton, Commissioner of the London Fire Brigade, said the Grenfell Tower fire should be a "turning point" for fire safety laws and spoke in favour of retrofit sprinkler installations in all high-rise council flats.



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Grenfell Tower is not the only serious fire in recent years where sprinklers could have saved lives, prevented injuries or reduced damage to property by preventing flames from spreading:

- **December 2017, Liverpool ECHO Arena** – Almost 1,400 cars destroyed in a fire over seven stories. Dan Stephens, Chief Fire Officer for Merseyside Fire and Rescue Service, later said that the fire could have been put out earlier if sprinklers had been installed.
- **November 2007, Coolmoyne House, County Antrim** – Four people treated by paramedics and many more forced from their flats after a fire in a 14-storey tower block.
- **July 2009, Lakanhal House, South London** – Six people killed and at least 20 injured when a fire spread through flats within a tower block. Southwark Council was later fined £570,000 over safety failings.
- **February 2005, Harrow Court, Stevenage** – Three people killed, including two firefighters, in a fire at a 17-storey tower block.

Approved Document B of the Building Regulations 2010:

“Sprinkler systems...can reduce the risk to life and significantly reduce the degree of damage caused by fire.”

Breaking barriers

Sprinkler systems can save lives. In light of these recent tragedies, this document highlights the perceived challenges to retrofit sprinkler installations and presents a viable solution through the use of press fit technology.

Through education and information, it is intended to serve as a best practice guide to help facilitate retrofit fire suppression measures in order to improve the safety of the UK’s existing building stock.

THE REGULATIONS

For residential properties, sprinkler systems must be designed and installed in accordance with BS9251:2014 fire sprinkler systems for domestic and residential occupancies - code of practice. For industrial and commercial properties, they must be designed and installed in accordance with BS EN 12845 fixed firefighting systems - automatic sprinkler systems - design, installation and maintenance.

In addition to these standards, under current fire safety laws and Building Regulations, sprinkler systems must be fitted in:

Scotland

- All new residential buildings taller than 18m, including care homes, sheltered housing and school accommodation (since 2005)

England and Northern Ireland

- All new buildings taller than 30m, including tower blocks, hospitals, offices and hotels (applicable since 2007). This includes individual flats within a tower block of 30m or taller, but not communal areas
- New warehouse premises of 20,000m² or above
- New retail premises of 2,000m² or above

Wales

- All new and refurbished residential accommodation (since 2016)
- New warehouse premises of 20,000m² or above



NOWHERE IN THE UK IS IT A REQUIREMENT TO RETROSPECTIVELY FIT SPRINKLER SYSTEMS IN EXISTING BUILDINGS.



A change in the law?

Under current fire safety laws, there is no requirement for retrofit sprinkler installations on any buildings in the UK. Although there was no specific recommendation in Dame Judith Hackitt's Independent Review into Building Regulations and Fire Safety (published May 2018), many believe this needs to change. Sprinkler systems save lives - why not make them mandatory?

In its key recommendations for baseline prescriptive requirements to provide clarity for professionals and protect the public, RIBA supports:

- Retrofitting of sprinklers/automatic fire suppression systems to existing residential buildings above 18m from ground level in height as 'consequential improvements' where an existing building is subject to 'material alterations'
- Sprinklers/automatic fire suppression systems in all new and converted residential buildings, as currently required under Regulations 37A and 37B of the Building Regulations for Wales

The Department for Communities and Local Government has previously said it will consider whether to retrofit sprinklers based on the recommendations of the Grenfell Tower inquiry.

Dany Cotton, Commissioner of the London Fire Brigade, said in September 2017:

"I support retrofitting - for me where you can save one life then it's worth doing. This can't be optional, it can't be a nice to have, this is something that must happen. If that isn't one of the recommendations (of the Grenfell Tower inquiry) then I will be so very disappointed."

The facts

2% Only 2 per cent of council tower blocks in the UK have full sprinkler systems fitted¹

6.5% Just 6.5 per cent of buildings over five storeys or 18m have sprinklers²

99% Research by the National Fire Chiefs Council shows that sprinklers are 99 per cent effective at containing, controlling or extinguishing fire when activated³

0 Nobody has ever died in the UK as a result of a fire in a building with a working sprinkler system⁴

¹<https://www.theguardian.com/uk-news/2017/sep/13/only-2-of-uk-council-tower-blocks-have-full-sprinkler-system-grenfell>

² <https://news.co.uk/news/uk/revealed-thousands-multi-storey-buildings-lack-fire-sprinklers/>

³https://www.nationalfirechiefs.org.uk/write/MediaUploads/NFCC%20Guidance%20publications/Protection/Optimal_Sprinkler_Report.pdf

⁴ <http://www.derbyshire-fire.gov.uk/campaigns/think-sprinkler/facts-and-figures/>

SPRINKLER SYSTEMS 101

Fixed sprinkler systems usually consist of water supply, pump and piping system made from either PVC, mild steel or stainless steel. Water can be supplied by a variety of methods including connection to the mains water supply or a storage tank. As a result, sprinklers are a relatively simple system to install and maintain, even in retrofit applications.

Connections between pipes are made either by soldering and welding (which involves hot works), by threading (which is a more untidy method), or by using press fit technology, which is cleaner, neater and does not require any hot works.



The perceived barriers to retrofit installations

Despite their clear benefits, retrofit sprinkler system installations in tower blocks and public buildings were rare before the Grenfell Tower fire because they are commonly seen as costly, disruptive and more of an inconvenient upgrade than a vital safety measure. Whilst these perceived barriers may be true for some outdated systems, it is not representative of the latest technologies available to contractors.

Here are four of the most commonly perceived barriers and why, with the right education, they should not prevent vital installations - even in advance of any potential change in fire safety laws.



→ Hot works

“We don’t want open flames from soldering or welding, which can pose a risk of fire in itself during installation.”

This is a valid point with soldered or welded pipe systems, particularly in mission critical buildings or where safety is of extra concern, like hospitals, education or care homes. Press fit systems, however, do not require hot works, which makes them the perfect choice for retrofit installations - more on that overleaf.

→ Disruption

“Residents have already raised concerns about disruption - how messy will it be and will they need to move out?”

Welding or soldering will inevitably be more messy than a press-fit system. As for disruption, the Callow Mount high rise retrofit pilot project¹ in 2011/12, backed by the British Automatic Fire Sprinkler Association, showed that installation of a press fit sprinkler system into a flat could be completed in less than one day without evacuating residents.

In fact, the whole scheme, covering 48 flats including lobbies, boiler rooms and bin stores, commissioning and snagging, was completed in just four weeks.

→ Aesthetics

“It’s too costly and disruptive to conceal pipes for a retrofit sprinkler system – but we can’t leave exposed pipes throughout the building?”

Press fit systems are also less costly and less disruptive than you might think because they can be easily installed within removable ceilings, with no need for hot works. Another way in which they can facilitate retrofit installations.

→ Cost

“We simply don’t have the budget. There are other fire suppression methods available at a cheaper cost.”

A sprinkler system in a new building generally costs no more than 1-2 per cent of the total build cost and whilst retrofit sprinkler systems will inevitably be more costly, a fire sprinkler system can be installed at a lower cost as part of other renovation works.

Put simply, there is no other fire suppression system as effective as sprinklers – nobody has ever died from a fire in the UK in a building with a working sprinkler system.

¹ https://www.bre.co.uk/filelibrary/Sustainability%20through%20Planning/Callow_mount_Retrofitting_sprinkler_systems_Steve_Seaber.pdf

THE SOLUTION: PRESS FIT SYSTEMS

In the search for flexible, fuss-free, cost-effective sprinkler systems for retrofit installations, press fit technology can provide the answer.



→ Fast connection

Pressing is not only straightforward, but also fast; simply cut to length, deburr, mount the fitting, press – and you're done.



→ Reliable connections

A pressing jaw with jaw guide helps prevent any risk of the joint slipping or being pressed in the wrong place and ensures reliable and durable connections.

→ Time saving

Press fit systems have been proven to take 30 per cent less time to install than their traditional counterparts according to a BSRIA report.

→ Clean

A cleaner job and a cleaner finish than other connection methods, which means residents do not have to evacuate their property for installation works.

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Whatever the outcome of any potential change in fire safety laws, press fit pipes are already proving a viable option to help local authorities, housing associations, property management companies and others to improve the safety of their buildings with minimum disruption.



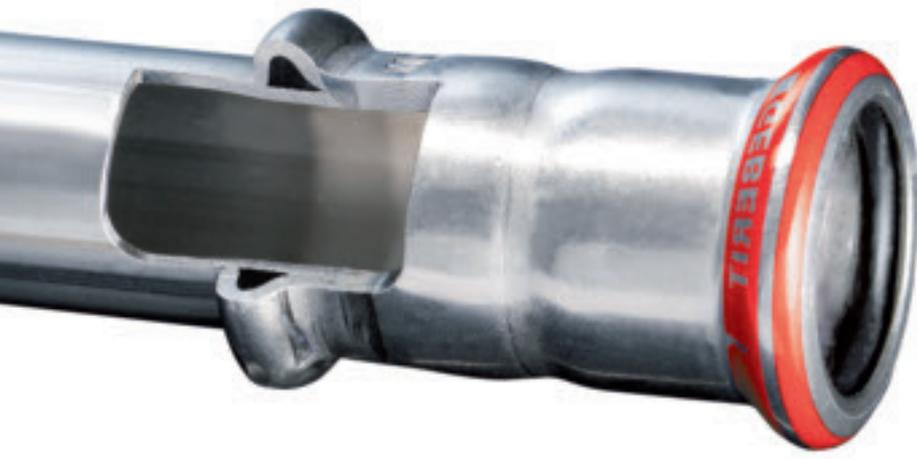
→ **Lightweight**

Use carbon steel for lightweight, flexible installation with no need to bring welding or soldering equipment on site.



→ **No hot works**

No need for welding or soldering, which means no additional protection measures are needed for retrofit work. No open flames, no risk of fire and no need for cool down time before you leave site. It can even lower insurance costs for installers and reduce insurance premiums for the building owner.



→ **Cost saving**

BSRIA calculates that the installation efficiencies of press-fit can deliver cost savings of approximately 27 per cent when compared with screwed steel pipework.



→ **Product innovation**

Leading manufacturers can also offer a series of product innovations including pressing indicators which offer easy identification of both material and unpressed joints during the installation process, and end caps for enhanced cleanliness.

USEFUL LINKS

- **Review of Building Regulations & Fire Safety, May 2018**
<http://bit.ly/HackittReportMay2018>
- **British Automatic Fire Sprinkler Association**
www.bafsa.org.uk
- **National Fire Sprinkler Network**
www.nfsn.co.uk
- **Residential Sprinkler Association**
www.firesprinklers.org.uk
- **European Fire Sprinkler Network**
www.eurosprinkler.org
- **Fire Safety: Approved Document B**
www.gov.uk/government/publications/fire-safety-approved-document-b
- **Efficiency and Effectiveness of Sprinkler Systems in the United Kingdom: An Analysis from Fire Service Data**
<http://bit.ly/NationalFireChiefs>
- **Geberit Sprinkler Systems Installation Guide**
<http://bit.ly/GeberitSprinklerInstallationGuide>

This document has been produced by Geberit.

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