



Sprinkler solution

Sprinkler systems are one of the most robust and reliable forms of fire protection available on the market. **Iain Cox** outlines the case for why their installation should be mandated in warehouse sizes more akin to those enforced in Europe

FIRE LOSS is more than just monetary. A fire in a business premises or warehouse can result in a multitude of issues that go way beyond the traditional concept of risk. These include interruption to business, cash-flow volatility, risk to life safety and reputational damage for the business involved – not to mention the impact on the supply chain, the local community and the environment.

Buildings are often uninhabitable after a fire. In contrast, however, a premises protected by a sprinkler system may be back up and running in just a few hours, and the rest of the building will often be unaffected. A valuable asset sprayed with water from a sprinkler can often be recovered or restored, whereas one that has been burnt is typically destroyed. Essentially, sprinklers render fires in industry non-events – mere distractions, with normal operations resuming quickly. In short, fire sprinklers can help to prevent major losses by turning what could be a potential disaster into a minor inconvenience, and they do so time and again with irrefutable reliability.

Protecting warehouses

In recent years, warehouses have increased in height and floor-size to the point where units measuring 20,000m² to 30,000m² are commonplace. Such warehouses operate very differently from the traditional model. Modern logistics demand large un compartmentalised spaces, densely packed goods, high-bay storage and largely automated systems,

with the types of goods stored changing on a daily basis. All these factors increase the risk of fire spreading quickly through the premises.

Warehouse businesses have seen the UK's largest losses as a result of fire, according to the Association of British Insurers (ABI) and the Fire Protection Association (FPA). Though there are fewer fires in warehouses than in manufacturing, the financial impact can be disproportionately higher because of the loss of property and stock, the costs related to business interruption, and the liability implications. In an era when business is already suffering the aftershock of the worst recession in living memory, these mounting and unnecessary losses are inexcusable, because they are wholly preventable. Below you can see key figures relating to the number of warehouse fires:

- 80,000 warehouses in England and Wales
- 621 fires in warehouses in 2012 – 588 in warehouses without sprinklers
- one in five warehouses in England and Wales will have a fire requiring the attendance of firefighters in its lifetime

The low-level of sprinkler use in UK warehouses can be attributed to a number of factors, including a lack of knowledge of the business benefits of sprinkler systems, as well as the nature of the regulated environment.

The published guidance from the Department for Communities and Local Government (DCLG) recommends that warehouses in England and Wales should be provided with a fire sprinkler system or equivalent fire prevention mechanism if they are larger than 20,000m².

By comparison, in the majority of the EU countries fire sprinklers must be installed in commercial and industrial properties with an average floor space one tenth of that size. Regulation on warehouses begins at greatly reduced space sizes in other countries:

- Belgium – 5,000m²
- France – 3,000m²
- Spain – 2,000m²
- Denmark – 2,000m²-5,000m² (dependent on fire load)
- Germany – 1,800m²
- Austria – 1,800m²
- The Netherlands – 1,000m²
- Norway – 800m²

Building Regulations

The guidance is provided by Approved Document B (ADB) of the Building Regulations (under the Building Act 1984). The Business Sprinkler Alliance and others have for some years been calling for ADB to be reviewed in order to make it more appropriate to changing business needs, to simplify its provisions, make design trade-offs more explicit, and redress anomalies such as the one requiring blocks of flats taller than 30m to have sprinklers, unless the residents are students.

The government has recently acknowledged that the cost benefit analysis for the next review of ADB will be broadened so that its focus covers environmental impacts alongside life safety considerations. The government's decision on this was informed by the 2011 Bureau Veritas report into the environmental impact of fires – a study commissioned by the BSA as part of its campaign for better information and positive change.

The 20,000m² threshold for sprinkler guidance in warehouses is a consequence of ADB being limited to life safety. Fortunately, there are very few injuries or deaths as a consequence of fires in commercial buildings. This is testament to the efficacy of ADB in ensuring that buildings are designed to allow safe evacuation in the event of a fire.

However, ADB does not take into consideration property or business protection. Although evidence suggests that the number of commercial building fires is decreasing, it is also a fact that the cost of each of these fires is increasing. That is why the BSA has more recently commissioned two new pieces of research to understand the benefits of sprinklers, and the true economic and societal costs and impacts of warehouse fires on UK. The findings of these reports are detailed below and they support the conclusion that any future review of ADB must consider all of these impacts or else UK businesses, the national finances and local communities will continue to bear the increasing costs of avoidable fires. Such work will result in more appropriate and user-friendly regulation, which should be welcomed by all involved



in the building process. However, it is inevitable that such a thorough review of ADB will take time.

In the meantime, the BSA will continue to work to stimulate a business-led increase in sprinkler use. The ultimate measure of success of the BSA's work will be a universal understanding and appreciation of the benefits that sprinklers offer UK businesses so that any future change to ADB complements the trend for the greater level of protection against the potentially devastating and costly impacts of fire. To this end, we are working with industry partners to ensure that companies are increasingly aware of the critical role fire sprinklers have to play in physical resilience.

Creating the case

To support our own firm belief in the business benefits of fire sprinklers, we commissioned and published three reports on sprinkler installation in single storey warehouses with independent research consultancies: the Centre for Economics and Business Research (Cebr), BRE Global Ltd and Bureau Veritas. The findings were eye-opening. In recent years there have been on average 600 fires in warehouses each year and the Cebr found that the British economy has lost £1 billion and 5,000 full-time jobs through preventable fires in commercial warehouses over the last five years.

What is clear from the current research is that insurance alone is not enough to fully protect companies from the long-term impacts of fire. Uninsured risks, such as business interruption and damaged supplier relationships, can cause lasting damage to companies suffering from fire. Such consequences can be avoided if businesses understand the importance of physical resilience and how to protect against the devastating impacts resulting from a blaze.

Cost benefit

In response to the increasing annual costs of fire, a three-year study was conducted independently by BRE Global to determine whether it is cost-effective

to install and maintain fire sprinklers in warehouses in England and Wales. The findings of the study are focused solely on warehouses and, as such, only begin to reveal the true financial return fire sprinklers bring to the wider business community. The report's findings conclusively show that sprinklers are, on average, a cost effective investment for warehouses with a floor area above 2,000m², with the greatest benefit arising from the reduction in direct fire losses.

The study looked at the whole-life cost benefit analysis for fire sprinkler installation in three ranges of warehouse sizes. Key findings from the BRE study include:

- the whole life costs for warehouse buildings larger than 2,000m² (around half a football pitch in size) with fire sprinklers are on average 3.7 times lower than ones without them
- fire sprinklers were, on average, not cost effective in warehouses with an area below 2,000m²
- environmental benefits from sprinklers include a reduction in carbon dioxide (CO₂) emissions from fire, reduced size of fire and reduced quantities of water used to fight fire
- only 20% of warehouses between 2,000 and 10,000m² are fitted with fire sprinklers – for warehouses above 10,000m², the estimated fraction with fire sprinklers is 67%

- if all warehouses above 2,000m² were fitted with sprinklers, the annual saving to businesses in England could be up to £210 million

Economic impact

Based on the findings of the BRE Global study, the BSA commissioned the Centre for Economics and Business Research (Cebr) to look into the impacts to business and the wider economy of fires that do not fall within the requirements of UK buildings guidance (ADB).

Fires in warehouses in which sprinklers are not installed are estimated to have had the following impacts on business, the economy, employment and the Exchequer:

- a direct financial loss to business of £230 million a year
- loss of £190m per year in productivity and impacts to the supply chain
- approximately 1,000 direct and indirect job losses annually through disruption and business failure
- a £160m loss to the Treasury in tax receipts over five years
- 135,000 tonnes of CO₂ released into the atmosphere per year
- CO₂ emissions and water used in firefighting valued at £11 million per year





- knock-on effects of each fire (such as road closures and air and water contamination) impacting more than 20 local business for every fire recorded

Role for sprinklers

The environmental impact of commercial building fires is usually all too evident, with air pollution caused by smoke and contaminated extinguishing water and foams polluting local water courses. In 2011, the BSA commissioned a study by Bureau Veritas, which investigated the impact on the environment and communities of fires in sprinklered and unsprinklered business buildings.

The study estimated that the installation of fire sprinklers across England and Wales would save an estimated nine billion litres of water per year; the equivalent of five times the UK's entire annual bottled water consumption. The report also found that fires in business buildings without sprinklers emit more than 350,000 tonnes of CO₂ each year, the equivalent of the annual emissions of more than 140,000 cars.

Key findings from the study included:

- nationally, between 25,945,920 and 18,865,392,000 litres of water are used to fight unsprinklered commercial and industrial fires per year
- only 4,368,000 litres of water would be used per year to fight fires in sprinklered buildings
- sprinklered fires are estimated to release between 7.8% and 21.6% less carbon emissions, compared with an unsprinklered fire in a similar building

Emulating Europe

The reality is that across Europe and in competitor economies, current regulation and guidance levels result in these markets being far better prepared and able to recover from fires that threaten their businesses and their economies. In short, the businesses are regulated in a way that encourages physical resilience.

In order for the UK to achieve this, businesses need to abandon the commonly held belief that fires will not happen in their premises. Research reveals that one in five warehouses in England alone will require the attendance of firefighters in its lifetime, but current business practices, common misconceptions and existing legislation are all barriers to the widespread

installation of fire sprinklers in business buildings. It's a slow and challenging piece of work, but UK plc needs to promote a better understanding of the importance of fire resilience in business. Better understanding of this critical component of commercial success will create a cultural change. In the future we hope that instead of people asking why they should install sprinklers, they will embrace them as a new and welcome norm ■

Iain Cox is chair of the Business Sprinkler Alliance. For more information, view page 5

Sony warehouse fire, London

ON 8 August 2011, the Sony Warehouse in Enfield was set on fire in a suspected arson attack during the 2011 London riots. The warehouse was 25,000m² in area. The fire resulted in the loss of the building's structural integrity, as well as 3.2 million units of stock including more than 1.5 million CDs and other media. The damage to the building alone was estimated at £10 million, and more than £80 million was paid out in insurance for the burnt and damaged contents.

A further cost of £0.21 million should be added to the total impact, this being the cost of the London Fire Brigade's attendance at the fire, which burned for 14 days. The fire also caused severe disruption to many other businesses' supply chains, with 150 businesses directly affected by damage to their stock.

On top of these longer-term supply-chain disruptions, the fire had an immediate impact on the businesses in close proximity to the warehouse and to activities in the local area. These included the closure of a series of other warehouses in the Solar Way Business Park (to the west), all of which ceased to operate for as many as three days as a result of the fire.

The building's replacement was opened 13 months after the event by Prime Minister David Cameron and it remains unsprinklered ■

NEY Ireland fire, Coventry

A FIRE at NEY Ireland's head office and plant located in Coventry occurred on 8 August 2012, due to suspected arson. The plant acted as a factory and warehouse for woodworking materials intended for use by furniture manufacturers. It destroyed at least 95% of the building, which was totally demolished in days. Most of the building's contents and machinery for production were also lost, damaging the factory's productive capability.

The fire caused a major traffic blockage to and from the industrial estate and to the neighbouring area, owing to the 400m exclusion zone put in place as a precautionary measure amid fears that acetylene cylinders inside the factory could explode ■