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SHEV systems to lead the way

For years, European Building Regulations have stipulated the inclusion of Smoke and Heat Exhaust Ventilation (SHEV) systems, as a standard fire safety measure in new buildings. As the UK becomes increasingly inclined to follow suit, General Manager of Jet Cox, Chris Lister, looks at how the building industry needs to prepare for the already-growing number of SHEV specifications.

On the basis that Europe is well-versed in the manufacture, installation and commissioning of SHEV systems, there seems little point in reinventing the wheel, when the UK can benefit from tried and trusted techniques. Since September 2006, Europe has required all SHEVs to be certified in accordance with DIN EN 12101-2 and whilst a number of UK manufacturers already work to these standards, Jet Cox has its history firmly rooted in Germany, where the inclusion of SHEV units is compulsory in all cases where Building Regulations require a natural smoke vent. As such they boast a long and successful track record of SHEV installations both across Europe and the UK, in accordance with these standards.

Why the need for SHEV systems?

The greatest immediate danger to the occupants of a large building in the event of a fire comes from the smoke rather than the heat of the fire. Only 20% of fire deaths in the UK are caused by burns. Worryingly, 61% of UK fire deaths are caused by smoke inhalation or injuries involving smoke inhalation. Even a small fire can rapidly fill a large building with smoke to an extent where people escaping the building cannot seem to find the escape routes and can be overcome by smoke inhalation.

It is the responsibility of the building owners, designers, developers and all of its stakeholders to ensure steps are taken to reduce the risk of fire and if fire does occur, that its occupants are suitably protected.

Often smoke incapacitates so quickly that people are overcome and can't make it to an otherwise accessible exit. The synthetic materials commonplace in today's buildings, produce especially dangerous substances. As a fire grows inside a building, it will often consume most of the available oxygen, slowing the burning process. This 'incomplete combustion' results in toxic gases. Smoke is made of components that can each be lethal in its own way:

- Particles: Unburned, partially burned, and completely burned substances can be so small they penetrate the respiratory system's protective filters, and lodge in the lungs. Some are actively toxic; others are irritating to the eyes and digestive system.
- Vapours: Fog-like droplets of liquid can poison if inhaled or absorbed through the skin.
- Toxic gases: The most common, carbon monoxide (CO), can be deadly, even in small quantities, as it replaces oxygen in the bloodstream. Hydrogen cyanide results from the burning of plastics, such as PVC pipe, and interferes with cellular respiration. Phosgene is formed when household products, such as vinyl materials, are burned. At low levels, phosgene can cause itchy eyes and a sore throat; at higher levels it can cause pulmonary edema and death.

The principal aim of SHEV systems is to lead smoke, gases and heat out of burning buildings, whilst also keeping escape routes free of smoke and toxic fumes. They also help in keeping passages clear allowing emergency services to enter safely and to tackle the fire in its early stages.

SHEVs are a significant component of a building's safety strategy, therefore correct commissioning and maintenance of the system is absolutely crucial to ensure that it operates correctly in the case of emergency. By drawing on the success of Europe's experience and renowned build-quality, UK building planners, designers and SHEV manufacturers can now work together to produce some of our safest, healthiest buildings. ■

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