intelliclad®
Smart detection for protection

Intelliclad Responds to Apartment Block Fire

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Introduction

Intelliclad is an external fire detection and alarm system, specially designed to be installed into the combustible façade of a high-risk building. This means that any fire which starts externally will be detected at an early stage, before it has even had a chance to spread and cause further damage, or endanger lives.

Our external installation is supported by a full internal system installed in line with the simultaneous evacuation guidance required to remove the waking watch.

The system uses smart sensors which are fitted inside the cladding cavity and are connected to a control system so that in the event of a fire, an alert can be sent to all residents via sounders, a unique smartphone app, PEEP specific devices such as vibrating pagers and the main common fire alarm system within the building, in compliance with BS 5839-1 L5.

Intelliclad is currently installed at a number of high-rise buildings across the UK, replacing waking watch patrols.

Case Study

Intelliclad has been installed in numerous buildings across the UK. Early in the summer of 2022, a fire started in a bin store on the ground floor of a block of flats in London. An Intelliclad sensor located in the bin store activated, and as the smoke spread outside, other sensors located on the façade also activated. The times of activation for each sensor are shown on the next page in **Diagram A**.

You can see from this that the response was rapid and residents were alerted to the fire in a matter of minutes. This also meant that the fire brigade were quickly notified and were at the scene shortly afterwards. Most importantly, there were no injuries or loss of life, the rapid detection, warning and response also ensured that not a single resident lost their home and the structure of the building was undamaged. None of the flats suffered any damage either, and once the incident had been dealt with, all occupants were able to return to their homes and continue as if nothing had happened.

This incident clearly demonstrates the advantages external detection has over internal detection. If reliance had been placed solely on internal heat detectors, the fire would have had to develop on the façade before the internal sensors were able to detect it. The warning to residents would have occurred much later, putting their lives at risk, and the damage to the building by that time would have been very extensive. It is the threat of severe damage which makes insurance premiums high for buildings containing combustible materials, but if the damage to property can be reduced, it is possible that insurance premiums may be lowered.

Since 2010

60%

of high-rise façade fires have started externally

causes include discarded cigarettes on balconies, external lighting malfunctions, air conditioning units breaking down and fires in bins.

Diagram A

Sensor Positioning

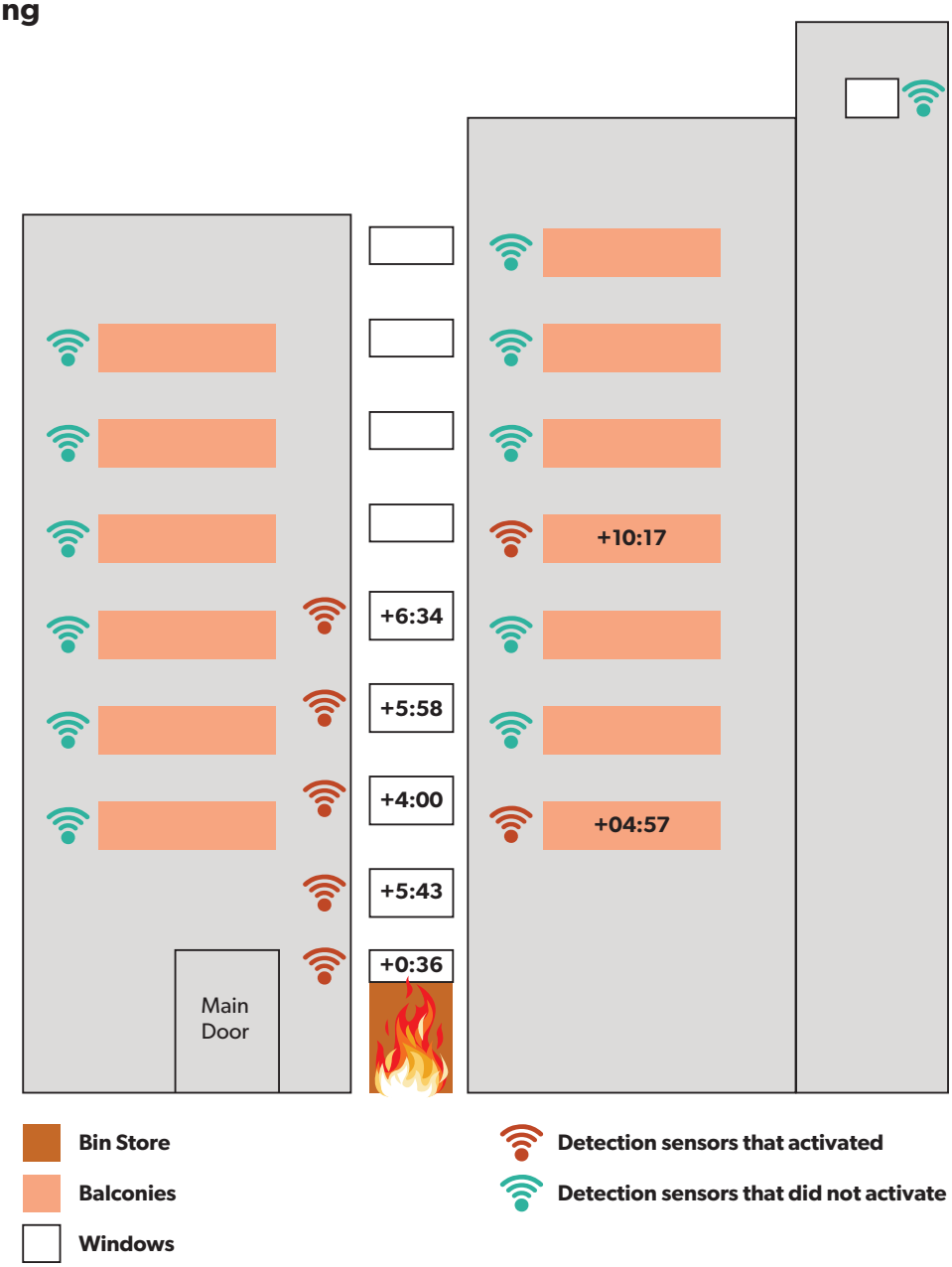

Diagram A shows the position of sensors in the building where the bin store fire occurred and the number of minutes after 5.15 am (the start time) when the first sensor – located in the bin store – detected the fire. Just four minutes later, an external sensor in the recess detected the fire, followed by another 57 seconds after that. Other sensors then progressively activated within seconds of each other until the fire was extinguished.

The building concerned possesses several factors which increase the risk to residents if the façade should catch fire. Firstly, the entire eight-storey building is completely covered in an insulated render system which contains expanded polystyrene or EPS, shown in **Photo 1.** EPS has a Euroclass rating of "E" which has a high contribution to fire.

Secondly, the bin store is located within a deep recess (see **Photo 2**), inside which there are windows. These windows are not in communal areas, but the flats themselves. Therefore, any fire which occurs, will spread rapidly up the recess, causing the glazing to fail and allowing the flames and toxic smoke to enter the flats.

Photo 1

A hole was cut in the insulated render to allow the Intelliclad sensor to be inserted. This revealed a thick layer of EPS with a gap behind through which air can be drawn and fire can spread. EPS is highly combustible and emits toxic fumes as it burns.

The Trench Effect

Research carried out by Intelliclad's Fire Engineer, Frances Maria Peacock has examined the relationship between building design and fire spread. This research has been used to explain the fire spread at Grenfell Tower and the Torre del Moro in Milan, as well as several others.

It looks at the fire dynamics associated with a building's geometry; it's overall shape, geometric profile and architectural features. The study found that the "Trench Effect", a phenomenon which was discovered after the Kings Cross escalator fire (London Underground) in 1987, can be applied to buildings too. The flames attach themselves to the trench floor (escalator steps or facing wall of a building), and the hot gases become trapped by the side walls, causing very intense and rapid fire spread.

Once the fire reaches the top of the trench, the flames are forcefully ejected (at roof-level on a building, and at the top of the escalator at Kings Cross, where flames shot across the ticket hall with intensity). It is for this reason that Intelliclad sensors are strategically placed, having used the principles derived from the research to identify the parts of the building which present the greatest risk. On this particular building, sensors were positioned in the recess as shown in the images, as well as the adjacent balconies.

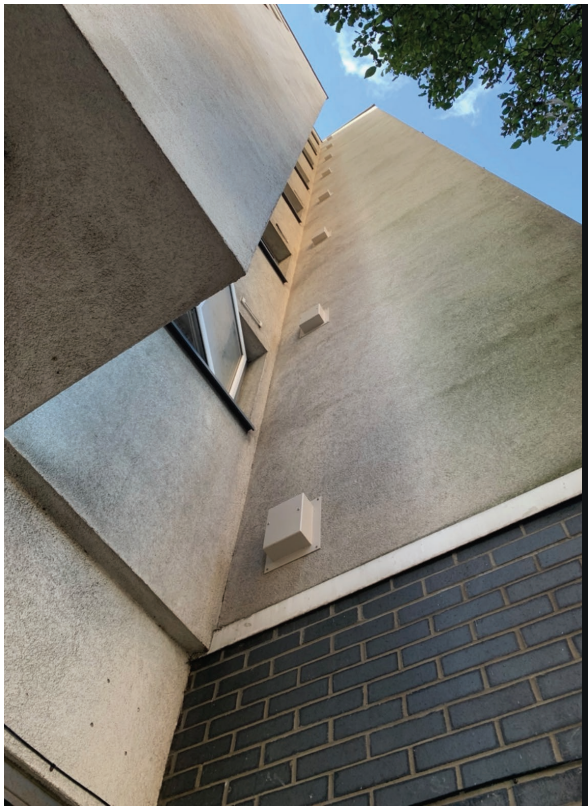

Photo 2

The deep recess contains windows from flats on that side of the building. Due to the depth of the recess, conditions are ideal for the Trench Effect to occur; the flames and hot gases would be fully contained within the recess, allowing the heat to build and the intensity of the fire to increase.

The glazing in the windows would readily fail during a fire due to the intense heat, allowing flames and toxic smoke from the EPS to enter the flats, greatly endangering the lives of the occupants. If internal detection only was installed, it would not be until the fire was at this advanced stage that its presence would be detected and residents warned.

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Detects internal
& external fires

3-year
battery life

Smartphone app
alerts residents

Sensor prohibits
false activations