

## 9. Smoke Control Systems

- 9.1. The Expert Panel believes that an appropriately designed, installed and maintained smoke control systems is essential to effectively managing fire safety risks in a residential building.
- 9.2. Smoke Control Systems play an important role in protecting escape routes in residential buildings in the event of fire. The primary objective being to protect the staircase enclosure, but the system may also provide some protection to the adjacent lobby or corridor.
- 9.3. Immediate action should be taken to remedy any defects in the operation of smoke control systems and the local Fire and Rescue Service should be informed if a smoke control system is not operating effectively.
- 9.4. Building owners should be aware of the type of smoke control system they have in place and how this is intended to control the spread of smoke in the event of fire. This should be available in original design information, but if it is not then building owners should seek professional advice to ascertain how it should function.
- 9.5. Depending on the number of stairs and the age of property, ventilation to remove smoke is normally installed in either the stair lobbies or corridors that form the common access area to the residential flats, as well as in the staircase enclosure itself. Simple smoke ventilation measures could comprise of manually or automatically opening windows, or in older buildings, permanently opening vents.
- 9.6. However, complex natural or mechanical smoke extraction systems can also be employed using smoke ventilation shafts or 'chimneys', particularly in more modern buildings. In some cases, where the building may only have one staircase, or where there are long common corridors, these can be mechanical single or two-speed smoke extract systems, with pressure sensors and manual override controls for fire fighters.
- 9.7. Where an automatic smoke control system is in place, in the event of heat and/or smoke entering the common parts it should vent that heat and smoke to allow the means of escape to continue to be safely used and to facilitate the fire-fighting activities within buildings.
- 9.8. In the case of an automatically opening system that relies on a smoke shaft, if smoke is detected the door/damper to the smoke shaft on that floor should open together with the vent at the top of the shaft. This creates a chimney effect, allowing the smoke to vent to open air. All other vents opening into the smoke shaft should remain closed in order to maintain the fire separation in the building,

prevent smoke spreading to other floors and avoid reducing the rate at which smoke is being vented from the affected floor.

9.9. The standards for the maintenance and testing of smoke control systems are set out in BS EN 12101 and BS 9999. Smoke control systems should be tested weekly by the building owner to ensure that they are operating effectively, with a full system inspection and test carried out by a suitably qualified person at least annually. If you are in any doubt as to the tests that should be carried out then you should contact the manufacturer or installer of the system for further information.

9.10. The Smoke Control Association provides advice on issues related to smoke control systems and have published a guide “Guidance on Smoke Control to Common Escape Routes in Apartment Buildings (Flats and Maisonettes)”. This is available on their website, along with other specific advice at:

[www.feta.co.uk/associations/hevac/specialist-groups/smoke-control-association](http://www.feta.co.uk/associations/hevac/specialist-groups/smoke-control-association)

9.11. There have been issues with electromagnetic holding devices for vents which can have an unpredictable performance leading to failure under fire conditions. Such failure can occur due to a loss of power to the devices, or through the magnetic fields of the devices being weakened as temperatures in and around the smoke shaft increase. It is therefore recommended that the use of electromagnetic holding devices as part of any smoke ventilation shaft installation should be reviewed as part of the fire risk assessment with consideration being given to replacing these devices with a more robust form of vent actuator.

9.12. Where the repair cannot be carried out immediately, a review of the fire risk assessment should be carried out to determine whether mitigation measures should be put in place. The mitigation measures to be put in place will vary from building to building and you should seek professional advice from a suitably qualified fire engineer. The local Fire and Rescue Service should also be informed and consulted on the planned mitigation measures.

9.13. The building may have other fire safety risks in place and these will need to be considered in developing the mitigation measures (for example, leaving vents on external walls open to disperse smoke may risk fire spread where combustible cladding is present). Issues around compartmentation should also be considered as defects that were low priority to remedy with a functioning smoke control system, may now be urgent.

9.14. Mitigation measures should remain in place until the smoke control system is repaired and has been tested to evidence that it is functioning effectively.