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## Automist, the LACoRS Guide and open plan houses – an Interpretation

The LACoRS Guide<sup>1</sup> provides extensive advice on compliance with the Housing Act and the Regulatory Reform (Fire Safety) Order in residential properties. For certain open-plan property layouts, however, the Guide leaves the reader with a difficult interpretation exercise. This document extracts elements from that guidance to demonstrate how the use of Plumis Automist sits in this context, particularly with reference to the Approved Document B (ADB) three storey open plan house layout. We first interpret each relevant paragraph from the LACoRS guide, and then collect this interpretation into a simpler set of statements.

In summary, this document will demonstrate that in ordinary “shared house” HMOs with an open plan living area, the ADB approach to open plan does comply with the recommendations of the LACoRS guide, and should be accepted as a suitable HMO layout. Automist is designed for this type of application and has LABC Registered Detail status, providing third party confirmation that Automist is a suitable means to provide fire suppression within this type of layout. Only in the highest-risk, truly bedsit-based HMO properties where residents live separate lives, does the LACoRS guide stop short of endorsing this layout.

We begin by setting the scene with a brief discussion of the nature and status of pre-engineered suppression devices such as Automist.

### Pre-engineered Suppression Devices

Although the LACoRS Guide allows for alternative standards in water suppression, Plumis is frequently asked how Automist fits with the sprinkler standard BS9251, and more recently the water-mist standard DD8458. The question is understandable because sprinklers are the only example of water suppression specifically mentioned in the LACoRS guide. It is important to understand that BS9251 sprinklers and Automist are different types of solution designed for different types of problem.

A sprinkler system is not an off-the-peg, “what you see is what you get” product: it is a project-specific selection of components that will perform as intended only when selected and assembled correctly. Its modularity makes it very flexible, allowing it to scale, covering areas from 10m<sup>2</sup> to 100,000m<sup>2</sup> and addressing settings from small houses to huge warehouses using exactly the same components. However, the modularity has a consequence: complexity. With elements such as nozzle flow and spacing, pipe diameters, pump pressure and flow, tank size and many other details subject to variation, a strict protocol must be followed for the system to perform correctly. This modularity and flexibility and the requirement for central infrastructure like pumps and tanks imposes a significant minimum cost on every installation, but economies of scale render this cost less significant as project size increases. Sprinklers are therefore much more cost-effective when protecting shopping centres, large warehouses and hotels, than they are in a single room. Because of this heritage, both BS9251 and the proposed DD8458 mandate suppression throughout a property: the single-room use case has not been standardised (despite being a common legal requirement in open plan houses).

If sprinklers are a bespoke solution, Automist is an off-the-peg, pre-engineered solution, designed for smaller projects that do not suit conventional sprinklers. In a pre-engineered device, design work is done upfront, by the manufacturer, and embedded within the product. There is little or no tailoring of components, because these characteristics are frozen into the design of the finished product. The result is a ready-made solution

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<sup>1</sup> HOUSING – FIRE SAFETY: Guidance on fire safety provisions for certain types of existing housing (ISBN 978-1-84049-638-3)

which still requires technical rigor in specification and installation, but requires it in a smaller and simpler set of tasks. The result is a water suppression unit well-suited to protect 1-2 rooms with an area of 32m<sup>2</sup>. Although no British Standard has yet been drafted for single-room fire suppression devices, an LABC Registered Detail, RD171<sup>2</sup>, does establish Automist as a suitable solution for Building Regulations purposes for these types of projects.

### Extracts from the LACoRS Guide

Section	Guide text	Interpretation
<b>1 Purpose of guidance</b>	1.3 This document does not set prescriptive standards but provides recommendations and guidance for use when assessing the adequacy of fire precautions in these types of premises. Alternative fire risk assessment methods may be equally valid in order to comply with fire safety law, and alternative approaches to individual fire safety solutions may be acceptable.	<p>The LACoRS guide is inherently based on a risk-assessment approach to fire safety and wedded to HHSRS.</p> <p>The guide is careful to say that it is not prescribing a specific set of the only solutions available and therefore does allow alternative and innovative solutions.</p>
<b>7 Introduction</b>	7.2 With these varying factors applying it is not credible to offer a single solution to fire safety which can be applied broadly. Fire safety solutions must instead be based on the level of risk presented by an individual property and its mode and level of occupation. Often alternative solutions are available which will provide an equally acceptable level of fire safety for a particular property, and sometimes identical properties may need different approaches due to differences in the types of occupation or the needs of the occupants.	Moreover, where headline solutions discussed in the LACoRS guide could be deemed “not reasonably practicable”, but alternatives are available that would be practicable, the alternatives must be considered under the risk assessment approach.
<b>9 Escape Routes</b>	<p>9.6 When considering the safety of the existing escape route, in addition to the occupant profile it is necessary to consider:</p> <ul style="list-style-type: none"> <li>• the layout and complexity of the route;</li> <li>• the travel distance to a place of safety;</li> <li>• the type of construction and state of repair; and</li> <li>• the presence of other fire safety measures such as automatic fire detection and warning systems, emergency lighting or fire suppression systems.</li> </ul>	This section establishes the principle (as per BS 9991) that the acceptability of a given escape route is influenced by the presence or absence of a fire suppression system.

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<sup>2</sup> [www.labc.uk.com/RegisteredDetail/Detail?id=171](http://www.labc.uk.com/RegisteredDetail/Detail?id=171)

<p><b>9 Escape Routes</b></p>	<p>9.7 In all buildings a fully protected escape route (staircase) offering 30 minutes fire resistance is the ideal solution and it will usually be appropriate for all bedsit-type accommodation. However, in lower risk buildings (i.e. single household occupancy of up to four storeys and low risk shared houses), due to the lower risk and shorter travel distance to the final exit, this need not be insisted upon as long as all the following conditions are met:</p> <ul style="list-style-type: none"> <li>• the stairs should lead directly to a final exit without passing through a risk room;</li> <li>• the staircase enclosure should be of sound, conventional construction throughout the route;</li> <li>• all risk rooms should be fitted with sound, close-fitting doors of conventional construction (lightweight doors and doors with very thin panels should be avoided); and</li> <li>• an appropriate system of automatic fire detection and warning is in place (see table C4).</li> </ul>	<p>This section establishes that an enclosed staircase is the norm and that in lower-risk properties, some imperfections in the fire performance of this enclosure can be accepted. It also clearly implies that this escape route may pass through a room whose “function, use or contents” does not present “a risk of fire occurring and developing”.</p>
	<p>9.8 An alternative solution is possible in low risk two storey shared houses. Where the first floor is no more than 4.5 metres above ground level, rooms used for sleeping could be provided with access to a suitable escape window from the first floor leading to a place of ultimate safety. In this situation consideration of the internal escape route is not essential. The option of escape windows will only be acceptable if they meet the requirements of paragraph 14, and, where they do not, the provisions of paragraph 9.7 should be usually applied. If it is necessary to pass through the common escape route to reach the escape window, consideration should be had to the travel distance involved. Where the common escape route is not a protected route, unusually long travel distances may be unacceptable and other fire precautions may be necessary (this will not usually be the case in conventional houses).</p>	<p>This section establishes that escape windows at first floor are an acceptable alternative way out of the building and that, when travelling to escape windows, even “unusually long travel distances” can be acceptable, provided that the route to the escape window is protected.</p>

<b>9 Escape Routes</b>	<p>9.9 In the worst-case scenario, it may be that the requirements of paragraphs 9.7 and 9.8 cannot be provided and the only exit internally is through a risk room. Whilst this should always be avoided where possible, in some cases it may be impracticable to do so. Where this is the case it may exceptionally be possible to accept exit via a risk room provided the exit from the bottom of the staircase at ground floor level is possible in more than one direction (i.e. via either the front or the rear rooms). 30-minute fire resisting construction and FD30S fire doors between each of the ground floor rooms and the staircase will be required alongside an enhanced system of automatic fire detection. Where escape from the bottom of the staircase is only possible in one direction, a further alternative might be the installation of a water suppression system. These arrangements will generally be unsuitable for bedsit-type occupation.</p>	<p>This section cites the example of a property where the escape route passes through a risk room in a way that is impracticable to change, and suggests that even where there is only a single direction of escape from the staircase, a water suppression system can enable this layout. However, in the case of bedsit-type occupation, it is stated that this package is not an adequate solution as described.</p>
	<p>9.10 When a fire starts, if there are no fire safety measures in place then the time that people have to escape before they become affected or trapped is extremely limited. The presence of fire safety measures extends this time. In practice this means the installation of some form of fire warning and detection system and an escape route which will remain unaffected by the fire for sufficient time to allow people to reach a place of safety. By necessity, the travel distance along the escape route must be limited.</p>	<p>This section again highlights the fact that additional fire safety measures such as interlinked alarms and fire suppression systems buy residents additional time for escape.</p>
	<p>9.12 If there is a suitable second staircase or exit or if there are additional fire safety measures (an enhanced system of fire detection and warning, for example, or a water suppression system), the premises may be considered lower risk and the travel distances and levels of protection may be adjusted accordingly where this lower risk can be demonstrated.</p>	<p>This section states that both a water suppression system and an enhanced detection system permit reclassification of the property as lower risk, and the consequent use of longer travel distances to places of relative safety / final exits.</p>

<b>26 Automatic Water Suppression Systems</b>	<p>26.8 Potential design freedoms: water suppression systems are not a fire safety solution in themselves. In isolation they cannot provide an acceptable level of fire safety in residential accommodation to meet the requirements of current legislation (see Appendix 1). However, as part of a comprehensive overall fire risk assessment they can be a key component in the overall solution and can contribute to a safe building. In particular the provision of a suitable water suppression system can, in some circumstances, allow for relaxed provision of certain other fire safety measures (but not all). Some examples of design freedoms which have been applied include reduced fire separation/compartimentation, an alternative to a secondary means of escape where impracticable, extended travel distances and relaxed requirements for inner rooms. However, the provision of automatic fire detection and warning systems cannot be relaxed. These must still be provided as adequate early warning of a fire is always essential.</p>	<p>Here, the document amplifies the statement in 9.6 above, making it clear that fire suppression and enhanced detection can enable “reduced fire separation / compartmentation, an alternative to a secondary means of escape where impracticable, extended travel distances and relaxed requirements for inner rooms”.</p>
	<p>26.10 Standards for water suppression systems: where a water suppression system is agreed upon, its design, installation and maintenance should be in accordance with BS 9251:2005 or another equivalent standard approved by the enforcing authority. Approval of the type of system and its design should be sought from the enforcing authority prior to installation.</p>	<p>This section establishes that alternatives to BS 9251 may be used as long as the enforcing authority agrees their use. It should be emphasised that BS 9251 is not generally suitable for the inner room problem as it is a whole-of-property solution, not an access room / outer room solution.</p>

<p><b>March 2009 LACoRS Briefing Note</b></p>	<p>2. Shared Houses</p> <p>Some discussion has occurred around the inclusion of the term “shared house” in the guidance. Shared houses, as described in paragraph 35.2 of the guidance, fall squarely within the Housing Act 2004 definition of House in Multiple Occupation (HMO). The guidance recognises this. However, when considering risk it is clear that certain types of shared house HMOs can present a lower risk than say, a bedsit type HMO. Consider two examples:</p> <p>1. A two storey house occupied by a small group of friends, work colleagues, etc, who occupy the property on a single tenancy, who exhibit no unusual high risk factors (see section 1 above) and who live together very much like a family. This property would be defined as an HMO under the Housing Act 2004. However this arrangement may present no significantly higher risk than an adjacent similar single family house which is not an HMO.</p> <p>2. A two storey house which has been divided into bedsit rooms occupied by unconnected individuals who live completely separate lives with no knowledge of who is around them in the house. The bedsit rooms each have individual cooking facilities, a lack of storage space and an inadequate numbers of electric sockets leading to overloading and trailing leads.</p> <p>The shared house HMO in example 1 will almost certainly present a lower risk than the bedsit HMO in example 2. It would not therefore be appropriate to apply the same fire precautions to both, as the level of risk is entirely different.</p>	<p>This guidance note was issued jointly by LACoRS, the CIEH and CFOA in March 2009<sup>3</sup> provides useful clarification.</p> <p>To quote LACoRS, “Following the meeting, the project steering group agreed to provide written clarification on some of the key issues that had been raised. This clarification has been agreed by all members of the project steering group which includes representatives from LACoRS, the Chartered Institute of Environmental Health, the Chief Fire Officers Association, the National HMO Network, the National Landlord Association, and Communities and Local Government. The written clarification was published on 30 March 2009.”</p> <p>The document makes it clear that the phrase “bedsit type HMO” refers to a specific type of higher risk property where residents live separate lives.</p>
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## Interpretation Summary

The LACoRS guide is inherently based on a risk-assessment approach to fire safety, and wedded to HHSRS. The guide is careful to say that it is not prescribing a specific set of the only solutions available and therefore does allow alternative solutions, and in cases where more traditional solutions are not reasonably practicable, the HHSRS approach clearly leads us towards alternative solutions that it would be reasonable to provide. When discussing automatic water suppression in section 26.10, the guide refers to alternatives to BS 9251 (examples might be single room-sprinkler systems, mist systems, or an appliance like Automist) and establishes that these may be used as part of a solution as long as the enforcing authority agrees their use. As discussed above, BS 9251 is not generally suitable for the inner room problem as it is a whole-of-property solution, not an access room / outer room solution.

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<sup>3</sup> <http://www.lacors.com/lacors/NewsArticleDetails.aspx?id=21330>

## Does the LACoRS guide endorse the Approved Document B three-storey open plan layout?

This question is frequently asked by environmental health and housing officers, as the LACoRS guidance does not explicitly offer model layouts of this type. The principal features of this ADB layout are the following:

- An escape route that passes through a living room that has fire suppression
- A second escape route from first floor windows
- Fire/smoke separation between first and ground floor.

LACoRS guide sections 9.6, 9.7, 9.8, 9.12 and 26.8 together establish some principles that will help in answering this question:

- That in lower-risk properties, a fully fire separated staircase may not be necessary;
- That without fire suppression, the escape route may pass through a room whose “function, use or contents” does not present “a risk of fire occurring and developing”;
- That (as per BS 9991) a fire suppression system enables an additional level of layout flexibility above and beyond this, and that fire suppression and enhanced detection can enable “reduced fire separation / compartmentation, an alternative to a secondary means of escape where impracticable, extended travel distances and relaxed requirements for inner rooms”, and a reclassification of the property as lower risk; and
- That escape windows at first floor are an acceptable alternative way out of the building and that, when travelling to escape windows, even “unusually long travel distances” can be acceptable, provided that the route to the escape window is protected.

Perhaps most importantly, section 9.9 tells us:

- That when an escape staircase passes through a risk room in a way that is impracticable to change, this layout may be rendered acceptable by a fire suppression system, even where there is only a single direction of escape from the staircase. This layout is not endorsed for bedsit accommodation, which was later clarified in the March 2009 memorandum as meaning properties where the residents effectively lead separate lives.

## Conclusions

For the highest-risk, truly bedsit-based HMO properties where residents live separate lives, the LACoRS guide stops short of endorsing the Approved Document B open plan three storey layout, effectively going beyond Building Regulations and British Standards in this case. However, it should be clear from the above analysis that in ordinary shared house type HMOs that are not in this highest risk category, the ADB approach to open plan does comply with the recommendations of the LACoRS guide, and should be accepted as a suitable HMO layout. As we have discussed, Automist is designed for this type of application and has LABC Registered Detail status, providing third party confirmation that Automist is a suitable means to provide fire suppression within the Approved Document B Approach to three-storey open plan living.