

MASSACGHUSETTS JOINT BUILDING CODE AND FIRE CODE SMOKE ALARM SUBCOMMITTEE

Summary of Conclusions and Recommendations FPFP Advisory Committee of the BBRS and 527 CMR 24 Subcommittee of the BFPR as of 12-6-07

This report will summarize the conclusions drawn by the Fire Prevention/ Fire Protection Advisory Committee of the Board of Building Regulations and Standards and the 527 CMR 24 Subcommittee of the Board of Fire Prevention Regulations concerning the technical factors related to the sensitivity of photoelectric and Ionization type smoke detectors to real fire conditions and non-fire conditions and other factors affecting the choice of detection technology for inclusion in the requirements of the Massachusetts State Building Code for new construction and in 527 CMR for certain existing occupancies. This summary is the result of the collective research of the two committees and individuals on the committees, including participation in the forum on the subject of smoke detector technology at the Department of Fire Services on October 11, 2007.

On the basis of that research, the Committees agree on the following conclusions:

- (1) Smoldering fires, in general, involve circumstances where the building occupants are often initially asleep or otherwise unaware of a fire occurrence and is the leading fire problem causing death and/or injury.
- (2) In general, the primary function of a smoke detector is to detect fire ignition and warn building occupants who are initially unaware of a fire occurrence.
- (3) Photoelectric type smoke detectors are more effective than ionization type smoke detectors for detection of smoldering fires in terms of time to detection and warning of comparable smoke conditions.
- (4) Photoelectric type smoke detectors are, in general, as effective as or only slightly less effective than ionization type smoke detectors for detection of flaming fires in terms of time to detection and warning of comparable smoke conditions.
- (5) Photoelectric type smoke detectors are significantly more effective in providing earlier detection and warning than ionization type smoke detectors in smoldering fires.
- (6) Smoldering fires cause a significant percentage of deaths and injuries due to fires in the Commonwealth per year.

(7) Based upon the foregoing, the use of working Photoelectric smoke detectors should provide an earlier warning to occupants of a building involved in smoldering fires, therefore providing an enhanced level of safety and a potential reduction in fire deaths and injuries in the Commonwealth.

(8) Photoelectric type smoke detectors are less susceptible than ionization type smoke detections to activation by common causes of nuisance alarms in the residential environment including cooking fumes and moisture from baths and showers.

(9) Smoke detectors employing photoelectric, ionization or dual technology are readily available from multiple manufacturers.

(10) Photoelectric type smoke detectors, in general for residential occupancies, are slightly more costly in than ionization type smoke detectors but the cost differential is minimal in new construction when installation costs including labor are included.

(11) Dual technology smoke detectors are, in general for residential occupancies, more costly than photoelectric type smoke detectors, but the cost differential is minimal in new construction when installation costs including labor are included.

(12) In general, for residential occupancies, dual technology detectors could provide maximum detection capability in a single device, but might introduce an unacceptable nuisance alarm problem due to cooking fumes and moisture from baths and showers.

Recommendations

It is the intent of these recommendations to require either photoelectric type or combination photoelectric and ionization type smoke detectors at all locations in residential occupancies and, by exception, to prohibit combination type smoke detectors within 20 feet of kitchens and bathrooms containing a tub or shower. The 20 feet prohibition is intended to extend into the common areas of multiple dwelling buildings that have common areas including corridors.