



## Fire Alarms & Detection: Smoke Detector Sensitivity

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**Learning Objective:** The student shall be able to list the testing requirements to ensure smoke detection devices are within their listed sensitivity range.

In other than one- and two-family dwellings, system detectors or single- or multiple-station smoke alarms should be subjected to a sensitivity test within one year after they are installed. The test is intended to ensure the sensing chamber remains calibrated within the sensitivity range established by the manufacturer. If a detector is too sensitive, it will be susceptible to nuisance alarms. If it is not sensitive enough, it may not operate in the presence of smoke.

According to the National Fire Protection Association (NFPA) 72, *National Fire Alarm Code*<sup>®</sup>, the sensitivity should be checked and calibrated every alternate year after the first test. If, however, after the second required calibration test, sensitivity tests show that the device has remained within its listed and marked sensitivity range (or 4-percent obscuration light gray smoke if not marked), the length of time between calibration tests may be extended to 5 years.

For sensitivity tests, any of the following tests may be performed to ensure that each detector is within its listed and marked sensitivity range:

1. Using a recognized, calibrated test method with smoke or listed aerosol.
2. Using the detector manufacturer's calibrated sensitivity test instrument.
3. Using listed control equipment (fire alarm control panels) that are arranged to perform sensitivity tests.
4. Using a combination smoke detector/control unit where the detector causes a signal at the control unit when its sensitivity is outside its listed sensitivity ranges.
5. Using any other calibrated sensitivity test methods approved by the code official.

Note that for the sensitivity tests, it is not required that smoke or aerosol be introduced into the detector. However, when conducting a performance test—to ensure that the detector senses smoke and generates an alarm—smoke or listed aerosol must enter the detection chamber. Performance tests and sensitivity tests are intended to achieve different results: the first is to ensure the device works, the second is to verify it remains within its listed range.

For additional information, refer to NFPA 72, Chapter 14.



This testing device provides a calibrated release of artificial smoke. It tests detector performance and can be used to evaluate the sensitivity.

