

- (1) Function as an engineered smoke-control system, including the provision of continuous air movement with the air-handling system
- (2) Provide air to other areas of the building during a fire emergency
- (3) Provide pressure differentials during a fire emergency

5.3.5.1.2 Smoke dampers shall not be required to be located within a prescribed distance of a smoke barrier where isolation smoke dampers complying with 4.3.9.2 are used in air-handling equipment.

5.3.5.1.3 Smoke dampers shall not be required where the air inlet or outlet openings in ducts are limited to a single smoke compartment.

5.3.5.1.4 Smoke dampers shall not be required in ducts where the air continues to move and the air-handling system installed is arranged to prevent recirculation of exhaust or return air under fire emergency conditions.

5.3.5.1.5* Smoke dampers shall not be required in health care occupancies where exempted by NFPA 101®, *Life Safety Code*®.

5.3.5.2 Where penetration of a smoke barrier is required to be provided with a fire damper, a combination fire and smoke damper equipped and arranged to be both smoke responsive and heat responsive shall be permitted.

5.4 Fire Dampers, Smoke Dampers, and Ceiling Dampers.

5.4.1 Fire Dampers.

5.4.1.1 Fire dampers used for the protection of openings in walls, partitions, or floors with fire resistance ratings of less than 3 hours shall have a 1½-hour fire protection rating in accordance with UL 555, *Standard for Safety Fire Dampers*.

5.4.2 Fire dampers used for the protection of openings in walls, partitions, or floors having a fire resistance rating of 3 hours or more shall have a 3-hour fire protection rating in accordance with UL 555, *Standard for Safety Fire Dampers*.

5.4.3* **Smoke Dampers.** Smoke dampers used for the protection of openings in smoke barriers or in engineered smoke-control systems shall be classified in accordance with UL 555S, *Standard for Safety Smoke Dampers*.

5.4.4 Ceiling Dampers.

5.4.4.1 Ceiling dampers or other methods of protecting openings in rated floor- or roof-ceiling assemblies shall comply with the construction details of the tested floor- or roof-ceiling assembly or with listed ceiling air diffusers or listed ceiling dampers.

5.4.4.2 Ceiling dampers shall be tested in accordance with UL 555C, *Standard for Safety Ceiling Dampers*.

5.4.5 Damper Closure.

5.4.5.1 All fire dampers and ceiling dampers shall close automatically.

5.4.5.1.1 All fire dampers and ceiling dampers shall remain closed upon the operation of a listed fusible link or other approved heat-actuated device located where readily affected by an abnormal rise of temperature in the air duct.

5.4.5.2 Fusible Links.

5.4.5.2.1 Fusible links shall have a temperature rating approximately 28°C (50°F) above the maximum temperature that normally is encountered when the system is in operation or shut down.

5.4.5.2.2 Fusible links shall have a temperature rating not less than 71°C (160°F).

5.4.5.2.2.1* Where combination fire and smoke dampers are located within air ducts that are part of an engineered smoke-control system, fusible links or other approved heat-responsive devices shall have a temperature rating approximately 28°C (50°F) above the maximum smoke-control system designed operating temperature.

5.4.5.2.2.2 The combination fire and smoke dampers shall not exceed the UL 555S, *Standard for Safety Smoke Dampers*, degradation test temperature rating of the combination fire and smoke damper.

5.4.5.2.2.3 The combination fire and smoke dampers shall not exceed a maximum temperature rating of 177°C (350°F).

5.4.5.3 A provision for remote opening of combination fire and smoke dampers, where necessary for smoke removal, shall be permitted.

5.4.5.3.1 Combination fire and smoke dampers permitted in 5.4.5.3 shall have provisions that allow them to reclose automatically upon reaching the damper's maximum degradation test temperature in accordance with UL 555S, *Standard for Safety Smoke Dampers*.

5.4.5.4* Dampers shall close against the maximum calculated airflow of that portion of the air duct system in which they are installed.

5.4.5.4.1 Fire dampers shall be tested for closure in accordance with UL 555, *Standard for Safety Fire Dampers*.

5.4.5.4.2 Smoke dampers shall be tested for closure in accordance with UL 555S, *Standard for Safety Smoke Dampers*.

5.4.5.4.3 Combination fire and smoke dampers shall not be required to have provisions that allow them to reclose automatically where provisions for automatic fan or airflow shut-down, in the event of a fire, are provided.

5.4.6 Installation.

5.4.6.1 The locations and mounting arrangement of all fire dampers, smoke dampers, ceiling dampers, and fire protection means of a similar nature required by this standard shall be shown on the drawings of the air duct systems.

5.4.6.2* Fire dampers, including their sleeves, smoke dampers, and ceiling dampers shall be installed in accordance with the conditions of their listings and the manufacturer's installation instructions.

5.4.6.3 The thickness of sleeves for fire dampers shall not be less than that associated with the conditions of rating required by Section 5.4.

5.4.6.3.1 Where UL 555, *Standard for Safety Fire Dampers*, permits sleeve thickness to be the same as that of the duct gauge, such thickness shall not be less than that specified in Table 5.4.6.3.1.