LA **909.3.1 System testing.** Prior to the issuance of a Certificate of Occupancy, all of the smoke-control systems shall be tested as required by the Department of Building and Safety and the fire department and shall show compliance with the minimum standards of both Departments. The tests shall be conducted in the presence of an authorized representative from both Departments. A report of the results shall be submitted to both Departments.

LA **909.3.2 Periodic retesting.** After occupancy of the building, all operating parts of the smoke-control systems shall be retested every 6 months in accordance with the retest requirements established by the Department of Building and Safety and the fire department. The retest shall be conducted by an approved inspection agency or by the owner or the owner's representative when so approved by both Departments. Also, a report of the test results shall be submitted to both Departments.

[F] 909.4 Analysis. A rational analysis supporting the types of smoke control systems to be employed, their methods of operation, the systems supporting them and the methods of construction to be utilized shall accompany the submitted construction documents and shall include, but not be limited to, the items indicated in Sections 909.4.1 through 909.4.6.

[F] 909.4.1 Stack effect. The system shall be designed such that the maximum probable normal or reverse stack effect will not adversely interfere with the system's capabilities. In determining the maximum probable stack effect, altitude, elevation, weather history and interior temperatures shall be used.

[F] 909.4.2 Temperature effect of fire. Buoyancy and expansion caused by the design fire in accordance with Section 909.9 shall be analyzed. The system shall be designed such that these effects do not adversely interfere with the system's capabilities.

[F] 909.4.3 Wind effect. The design shall consider the adverse effects of wind. Such consideration shall be consistent with the wind-loading provisions of Chapter 16.

[F] 909.4.4 HVAC systems. The design shall consider the effects of the heating, ventilating and air-conditioning (HVAC) systems on both smoke and fire transport. The analysis shall include all permutations of systems status. The design shall consider the effects of the fire on the HVAC systems.

[F] 909.4.5 Climate. The design shall consider the effects of low temperatures on systems, property and occupants. Air inlets and exhausts shall be located so as to prevent snow or ice blockage.

[F] 909.4.6 Duration of operation. All portions of active or passive smoke control systems shall be capable of continued operation after detection of the fire event for a period of not less than either 20 minutes or 1.5 times the calculated egress time, whichever is less.

[F] 909.5 Smoke barrier construction. Smoke barriers shall comply with Section 709, and shall be constructed and sealed to limit leakage areas exclusive of protected openings. The maximum allowable leakage area shall be the aggregate area calculated using the following leakage area ratios:

1. Walls: $A/A_w = 0.00100$
2. Exit enclosures: $A/A_w = 0.00035$
3. All other shafts: $A/A_w = 0.00150$
4. Floors and roofs: $A/A_F = 0.00050$

where:

A = Total leakage area, square feet (m^2).

A_F = Unit floor or roof area of barrier, square feet (m^2).

A_w = Unit wall area of barrier, square feet (m^2).

The leakage area ratios shown do not include openings due to doors, operable windows or similar gaps. These shall be included in calculating the total leakage area.

[F] 909.5.1 Leakage area. The total leakage area of the barrier is the product of the smoke barrier gross area multiplied by the allowable leakage area ratio, plus the area of other openings such as gaps and operable windows. Compliance shall be determined by achieving the minimum air pressure difference across the barrier with the system in the smoke control mode for mechanical smoke control systems. Passive smoke control systems tested using other approved means such as door fan testing shall be as approved by the fire code official.

909.5.2 Opening protection. Openings in smoke barriers shall be protected by *self-closing devices* or automatic-closing devices actuated by the required controls for the mechanical smoke control system. Door openings shall be protected by fire door assemblies complying with Section 715.4.3.

Exceptions:

1. Passive smoke control systems with automatic-closing devices actuated by spot-type smoke detectors listed for releasing service installed in accordance with Section 907.10. *When used in a Group I-2, such detectors shall activate the fire alarm system.*
2. Fixed openings between smoke zones that are protected utilizing the airflow method *in other than Group I-2.*
3. In Group I-2, where doors are installed across corridors, a pair of opposite-swinging doors without a center mullion *or horizontal sliding doors that comply with Section 1008.1.3.3 shall be installed. Vision panels consisting of fire-rated glazing in approved frames shall be provided in each cross-corridor swinging door and at each cross-corridor horizontal-sliding door in a smoke barrier.* The doors shall be close fitting within operational tolerances, and shall not have undercuts, louvers or grilles. *Swinging* doors shall have head and jamb stops *and* astragals or rabbets at meeting edges. *Doors installed across corridors* shall be automatic closing by smoke detection in accordance with Section 715.4.7.3. Positive-latching devices are required. *Doors installed across corridors shall comply with Section 1008.1.1.*
4. Group I-3.
5. Openings between smoke zones with clear ceiling heights of 14 feet (4267 mm) or greater and bank-down capacity of greater than 20 minutes as determined by the design fire size.
6. *In Group I-2, smoke damper activation may be accomplished by a fire alarm control unit, provided that an open area smoke detection system is provided within all areas served by an HVAC system.*