502.4 Air leakage (Mandatory).

502.4.1 Window and door assemblies. The air leakage of window and sliding or swinging door assemblies that are part of the building envelope shall be determined in accordance with AAMA/WDMA/CSA 101/LS.2/A440, or NFRC 400 by an accredited, independent laboratory, and labeled and certified by the manufacturer and shall not exceed 0.3 cfm per square foot (1.5 L/s/m²), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m²).

Exception: Site-constructed windows and doors that are weatherstripped or sealed in accordance with Section 502.4.3.

502.4.2 Curtain wall, storefront glazing and commercial entrance doors. Curtain wall, storefront glazing and commercial-glazed swinging entrance doors and revolving doors shall be tested for air leakage at 1.57 pounds per square foot (psf) (75 Pa) in accordance with ASTM E 283. For curtain walls and storefront glazing, the maximum air leakage rate shall be 0.3 cubic foot per minute per square foot (cfm/ft²) (5.5 m³/h × m²) of fenestration area. For commercial glazed swinging entrance doors and revolving doors, the maximum air leakage rate shall be 1.00 cfm/ft² (18.3 m³/h × m²) of door area when tested in accordance with ASTM E 283.

502.4.3 Continuous air barrier. Except in unheated structures and as permitted by this section, a continuous air barrier shall be installed, sealing all seams, openings, and penetrations of the building and shall be sealed with caulking materials or closed with gasketing systems compatible with the construction materials and location. Joints and seams shall be sealed in the same manner or taped or covered with a moisture vapor-permeable wrapping material. Sealing materials spanning joints between construction materials shall allow for expansion and contraction of the construction materials. Such air barrier shall have all the following characteristics:

1. Continuous throughout the envelope with all joints and seams sealed and with sealed connections between all transitions in planes and changes in materials and at all penetrations.
2. Joined and sealed in a flexible manner to the air barrier component of adjacent assemblies, allowing for the relative movement of these assemblies and components.
3. Installed in accordance with the manufacturer’s instructions and in such a manner as to achieve the performance requirements.
4. Penetrations of the continuous air barrier shall be made in a way such that the integrity of the continuous air barrier is maintained.

502.4.3.1 Compliance. Compliance for continuous air barriers may be demonstrated using any one of the following three methods:

1. Materials. Using individual materials that have an air permeability not to exceed 0.02 L/s · m² under a pressure differential of 75 Pa [0.04 cfm/ft² under a pressure differential of 0.3 in. water (1.57 lb/ft²)] when tested in accordance with ASTM E 2178.
2. Assemblies. Assemblies of materials and components shall have an average air leakage not to exceed 0.2 L/s·m² under a pressure differential of 75 Pa [0.04 cfm/ft² under a pressure differential of 0.3 in. water (1.57 lb/ft²)] when tested in accordance with ASTM E 2357 or ASTM E 1677. In addition these assemblies must meet the requirement for joints per Section 502.4.3.
3. Building. Testing the completed building and demonstrating that the air leakage rate of the building envelope does not exceed 2.0 L/s-m² under a pressure differential of 75 Pa [0.4 cfm/ft² at a pressure differential of 0.3 in. water (1.57 psf)] in accordance with ASTM E 779 or an equivalent approved method.

502.4.4 Outdoor air intakes and exhaust openings. Stair and elevator shaft vents and other outdoor air intakes and exhaust openings integral to the building envelope shall be equipped with not less than a Class I motorized, leakage-rated damper with a maximum leakage rate of 4 cfm per square foot (6.8 L/s · m²) at 1.0 inch water gauge (w.g.) (1250 Pa) when tested in accordance with AMCA 500D.

Exception: Gravity (nonmotorized) dampers are permitted to be used in buildings less than three stories in height above grade.

502.4.5 Loading dock weatherseals. Cargo doors and loading dock doors shall be equipped with weatherseals to restrict infiltration when vehicles are parked in the doorway.

502.4.6 Vestibules. A door that separates conditioned space from the exterior shall be protected with an enclosed vestibule, with all doors opening into and out of the vestibule equipped with self-closing devices. Vestibules shall be designed so that in passing through the vestibule it is not necessary for the interior and exterior doors to open at the same time.

Exceptions:

1. Doors not intended to be used as a building entrance door, such as doors to mechanical or electrical equipment rooms.
2. Doors opening directly from a sleeping unit or dwelling unit.
3. Doors that open directly from a space less than 3,000 square feet (279 m²) in area.
4. Revolving doors.
5. Doors used primarily to facilitate vehicular movement or material handling and adjacent personnel doors.

502.4.7 Recessed lighting. Recessed luminaires installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and labeled as meeting ASTM E 283 when tested at 1.57 psf (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. All recessed luminaires shall be sealed with a gasket or caulk between the housing and interior wall or ceiling covering.