

or lesser rate of introduction of contaminants from outdoor sources will be attained.

5.5.2 Rain Entrainment. Outdoor air intakes that are part of the mechanical ventilation system shall be designed to manage rain entrainment in accordance with one or more of the following:

- a. Limit water penetration through the intake to $0.07 \text{ oz/ft}^2\cdot\text{h}$ ($21.5 \text{ g/m}^2\cdot\text{h}$) of inlet area when tested using the rain test apparatus described in Section 58 of UL 1995¹⁰.
 - b. Select louvers that limit water penetration to a maximum of 0.01 oz/ft^2 (3 g/m^2) of louver free area at the maximum intake velocity. This water penetration rate shall be determined for a minimum 15-minute test duration when subjected to a water flow rate of 0.25 gal/min (16 mL/s) as described under the water penetration test in AMCA 500-L¹¹ or equivalent. Manage the water that penetrates the louver by providing a drainage area or moisture removal devices.
 - c. Select louvers that restrict wind-driven rain penetration to less than $2.36 \text{ oz/ft}^2\cdot\text{h}$ ($721 \text{ g/m}^2\cdot\text{h}$) when subjected to a simulated rainfall of 3 in. (75 mm) per hour and a 29 mph (13 m/s) wind velocity at the design outdoor air intake rate with the air velocity calculated based on the louver face area.
- Informative Note to 5.5.2(c):** This performance corresponds to Class A (99% effectiveness) when rated according to AMCA 511¹⁵ and tested per AMCA 500-L¹⁶.
- d. Use rain hoods sized for no more than 500 fpm (2.5 m/s) face velocity with a downward-facing intake such that all intake air passes upward through a horizontal plane that intersects the solid surfaces of the hood before entering the system.
 - e. Manage the water that penetrates the intake opening by providing a drainage area or moisture removal devices.

5.5.3 Rain Intrusion. Air-handling and distribution equipment mounted outdoors shall be designed to prevent rain intrusion into the airstream when tested at design airflow and with no airflow, using the rain test apparatus described in Section 58 of UL 1995¹⁰.

5.5.4 Snow Entrainment. Where climate dictates, outdoor air intakes that are part of the mechanical ventilation system shall be designed as follows to manage water from snow that is blown or drawn into the system:

- a. Access doors to permit cleaning of wetted surfaces shall be provided.
- b. Outdoor air ductwork or plenums shall pitch to drains designed in accordance with the requirements of Section 5.10.

5.5.5 Bird Screens. Outdoor air intakes shall include a screening device designed to prevent penetration by a 0.5 in. (13 mm) diameter probe. The screening device material shall be corrosion resistant. The screening device shall be located, or other measures shall be taken, to prevent bird nesting within the outdoor air intake.

Informative Note: Any horizontal surface may be subject to bird nesting.

5.6 Local Capture of Contaminants. The discharge from noncombustion equipment that captures the contaminants generated by the equipment shall be ducted directly to the outdoors.

Exception: Equipment specifically designed for discharge indoors in accordance with the manufacturer's recommendations.

5.7 Combustion Air. Fuel-burning appliances, both vented and unvented, shall be provided with air for combustion and removal of combustion products in accordance with manufacturer instructions. Products of combustion from vented appliances shall be vented directly outdoors.

5.8 Particulate Matter Removal. Particulate matter filters or air cleaners having a minimum efficiency reporting value (MERV) of not less than 8 when rated in accordance with ANSI/ASHRAE Standard 52.2¹² shall be provided upstream of all cooling coils or other devices with wetted surfaces through which air is supplied to an occupiable space.

Exception: Cooling coils that are designed, controlled, and operated to provide sensible cooling only.

5.9 Dehumidification Systems. Mechanical air-conditioning systems with dehumidification capability shall be designed to comply with the following subsections.

5.9.1 Relative Humidity. Occupied-space relative humidity shall be limited to 65% or less when system performance is analyzed with outdoor air at the dehumidification design condition (that is, design dew-point and mean coincident dry-bulb temperatures) and with the space interior loads (both sensible and latent) at cooling design values and space solar loads at zero.

Exception: Spaces where process or occupancy requirements dictate higher humidity conditions, such as kitchens; hot-tub rooms that contain heated standing water; refrigerated or frozen storage rooms and ice rinks; and spaces designed and constructed to manage moisture, such as shower rooms, pool rooms, and spa rooms.

Informative Note: System configuration, climatic conditions, or a combination of both might adequately limit space relative humidity at these conditions without additional humidity-control devices. The specified conditions challenge the system dehumidification performance with high outdoor latent load and low space sensible heat ratio.

5.9.2 Building Exfiltration. Ventilation systems for a building shall be designed such that the total building outdoor air intake equals or exceeds the total building exhaust under all load and dynamic reset conditions.

Exceptions:

1. Where an imbalance is required by process considerations and approved by the authority having jurisdiction, such as in certain industrial facilities.
2. When outdoor air dry-bulb temperature is below the indoor space dew-point design temperature.

Informative Note: Although individual zones within a building may be neutral or negative with respect to outdoors