

Ventilation (Outdoor) Air for Buildings

The Florida Mechanical code requires the introduction of outdoor air for all buildings to maintain a healthy indoor environment for the occupants within the enclosed space.

Outdoor air that is mechanically introduced must be “fresh” outdoor air, or air that is not contaminated. Outdoor air intake openings should be located a minimum of 10 feet from any noxious contaminant (plumbing vents, chimneys, streets, alleys, and parking lots to name a few). Section 403 of the Florida Mechanical Code completely describes the amount of fresh outdoor air required and is based on the building use and occupancy.

Summer outdoor air in Florida is hot (95 degrees) and moist (80% humidity) so outdoor air is not desired indoors except at the controlled cfm rate as required by code. Occupants who are sensitive to outdoor air contaminants could suffer if the outdoor air rates are too high. Occupants who are sensitive to indoor air contaminants will suffer if the outdoor air rate is too low. The air conditioning system will need to be sized correctly in order to remove the extra heat and moisture caused by the introduction of outdoor air, so introducing the correct amounts of outdoor air is critical. An energy recovery ventilator is useful for our sub-tropic environment, the ERV will reduce the heat and moisture of the outdoor air before the air is introduced to the air handler return air plenum.

Residential outdoor air is required at a rate of 15 cfm of fresh outdoor air per person.

Most every Florida home (homes with more than 20% glass to floor area) naturally “leak” the code required cfm amounts through windows and doors, so mechanically introduced outdoor air is not required – but is desired if a building is built using “tight” envelope construction; verified with a blower door test. Building infiltration (leakage) amounts are based on the building heat load calculations performed prior to construction – see heat load calculation printout for natural building infiltration rates expected in the field. If the infiltration cfm rate shown on the heat load calculations meets or exceeds the code required outdoor air rate - then mechanically (ducted) introduced outdoor air is not required. Only homes with too little infiltration (for occupant health) require mechanically induced fresh outdoor air. Note: mechanically induced ventilation air will become a mandatory code midsummer 2015 – with motorized damper closure.

Commercial outdoor air is required at a rate shown in table 403.3 of the Florida Mechanical code. Commercial projects require a ducted fresh outdoor air duct on any hvac equipment conditioning spaces that contain people. Occupant amounts and occupant activity levels become very important when performing a commercial building heat load and ventilation calculations. The amount of fresh outdoor air required for occupant health will vary greatly depending on how the building is classified (office, church, retail, specialty), time of occupancy, and occupant duration. Ventilation must be designed to maintain a neutral or positive interior building pressure (Florida Mechanical Code 403.1), so the amount of exhaust air from the building interior must be approximately equal to the amount of fresh outdoor air being introduced into the building interior. Indoor air fans (air handler) must operate continuously during occupied hours (Florida Mechanical Code 401.3) when used to introduce the required outdoor air. Occupants with occupancy times of less than 3 hours should be adjusted to 1/2 of the listed recommended cfm rate (waiting rooms, conference rooms, exam rooms, etc.). Outdoor air should only be introduced during occupied hours.