

Indoor Air Filtration Within Classrooms Designed to Meet ASHRAE* Standard 62-89



Demographic changes in the Miami, Florida area forced the Dade County School Board to construct new primary learning centers in order to accommodate the influx of new students.

For the first phase of this project, four different sites were chosen as locations for the primary learning centers. The engineers who were given the mandate to design the centers' air conditioning systems were faced with a twofold challenge.

The first was to provide adequate heating and cooling to the school classrooms and the second was to ensure that this would be accomplished at a minimal operating cost while guaranteeing acceptable indoor air quality.

Achieving Acceptable Air Quality Through ASHRAE Standard 62-89

Current guidelines surrounding school ventilation requirements, as well as most local codes refer either directly or in part to ASHRAE's Standard 62-89 "Ventilation for Acceptable Indoor Air Quality". The Standard outlines the requirements for ventilation as it relates to maintaining steady-state concentrations of most pollutants below acceptable levels

Primary Learning Center, Miami, Florida

within the occupied space. For the classroom ventilation within the primary learning centers, the outdoor air requirement is 15 CFM/person (ASHRAE Standard 62-89, Table 2).

Although ASHRAE's Ventilation Rate Procedure (Section 6.1, S62-89) can be used to provide the designer with reasonable guidelines so as to ensure adequate indoor air quality, the "Outdoor Air" in this guideline is assumed to be of acceptable quality.

If the outdoor air is deemed to be deficient in terms of quality (Section 6.1.2, S62-89), then the designer is encouraged to incorporate air cleaning techniques to control the offending contaminants. Moreover, if the designer chooses to employ energy conservation techniques to the ventilation design, the Indoor Air Quality Procedure of the Standard should be used (Section 6.2, S62-89).

Circul-Aire APS-400 designed for maximum sound attenuation



Maximize Energy Efficiency and Provide Air Quality Within Classrooms

The rationale behind the design of the learning centers was to address the possibility of outdoor air quality problems as well as provide the indoor environment with adequate air quality at a minimum operational cost.

By installing Circul-Aire's APS-400 filtration/recirculation system in each classroom, the designers were able to achieve their filtration requirements and reduce the amount of outdoor air by approximately 50%. The reduction of outdoor air translates into significant yearly cooling energy reductions, while the constant recirculation provides the students with a "contaminant free" environment. The indoor air quality procedure allowed the designers to achieve this by applying the "Air Cleaning" section of the Standard (6.2.3, S62-89) as a recirculation system.

Circul-Aire's APS-400 incorporates a 30% pre-filter, one stage of MM-1355 media (combination of activated carbon and potassium permanganate), a 30% efficient after-filter and a final 90% particle filter. Typical concentrations of pollutants generated within classrooms can cause irritation and/or fatigue. Similarly, the presence of even acceptable levels of sulfur oxides, nitric oxides, hydrocarbons and ozone in outdoor air can subject the occupant to the same symptoms.

To ensure that these contaminants are removed before they enter the space, chemical filtration was the air cleaner of choice. The media formulation in this case was designed to absorb the full spectrum of contaminants that might be present in either the outdoor air or generated within the classroom.

TECH-CHEK™ Service for Maintenance Monitoring

The maintenance of the APS-400 Air Purification System has also been simplified with the TECH-CHEK™ Service supplied by Circul-Aire. With this exclusive service, media samples are tested in order to verify consumption rates.

This lifetime service is monitored by a computerized program from Circul-Aire that indicates the appropriate schedule for media replacement.

This customized service, supplied at no additional charge, not only provides a precise maintenance schedule, but also ensures the highest performance of the APS-400 Air Purification System installed at the Primary Learning Centers in Miami, Florida.



Typical Primary Learning Center classroom incorporating a ceiling suspended APS-400

FOR MORE INFORMATION ON A SPECIFIC APPLICATION, PLEASE CONTACT YOUR LOCAL REPRESENTATIVE OR CIRCUL-AIRE.

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