# MANAGING AIRCONDITIONING AND NEEDS OF IAQ, COST EFFECTIVELY . . . . . IN HOTELS

***Hotels . . . . Hotel Rooms require a minimum of 60-70 cfm fresh air require per room to preserve furnishing and maintain fire safety standards. This translates to a separate air handling unit for treating fresh air for all floors.***

Similarly, Hospitals, Nursing Homes, Restaurants, Banquet Halls, Commercial Buildings (Super Markets, Airport Lounge, Airconditioned Shopping Halls, offices), Animal Houses, Gas Turbine intake, also need large volumes of treated preconditioned air to satisfy the need for energy efficiency and Indoor Air Quality.

*Engineers, and Designers, today, constantly face the challenge to conceptualise, design and specify* ***cost-effective solution*** *for treating large volumes of fresh air.*

***An ideal 'airconditioning' equipment should sanitise, cool, heat, humidify/dehumidify, evenly distribution air through the area and all; cost effectively. That is the challenge, the designer faces today.***

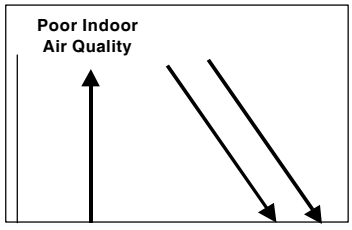
**Indoor Air**

**is more polluted**

**than**

**outdoor air**

**Myth or Reality?**




Let us look a little more closely at needs of Indoor Air Quality which dictate the choice of a system for Treating Fresh Air, especially in hotels.

Airconditioning is a major factor affecting Indoor Air Quality (IAQ). **Majority of airconditioning systems are designed with very little or almost no provision for fresh air, as fresh air means, more kilowatts of conditioning and thus, higher energy cost.**

Inadequate ventilation, coupled with recirculation of state air, result in Poor Indoor Air Quality (IAQ), due to a build up of pollutants like cigarette smoke, carbon-dioxide, mold, bacteria, viruses and potentially dangerous chemicals emitted from copying machines, furniture, carpets and paint. The high concentration of pollutants in indoor conditioned space causes a phenomenon known as the "**Sick Building Syndrome**". This is a term that describes the presence of acute non-specific symptoms in the majority of the people caused by working in buildings with an adverse indoor environment. It is a cluster of environment. It is a cluster of complex symptoms that include irritation of the eyes, blocked nose and throat, headaches, dizziness, wheezing, sinus, congestion, dry skin rash and nausea.

**The feeling of illness among occupants majority of occupants of a conditioned space is called**


**Relief occurs when the occupant leaves the building.**

These symptoms are generally work related, that is, they begin shortly after the person enters the building and disappear within a few hours, after he leaves it.

A more and long term effect on health may arise due to a continued exposure to a building related illness.

**Increasing ventilation, however, hikes up energy costs substantially.** With the recent adoption of ASHRAE (American Society of Heating, Refrigeration and Airconditioning Engineers) Standard 62-89, the recommended levels of outside air brought into buildings has been increased by as much as 400%. **This imposes**

**Reproduced below are the recommended ventilation rates under the ASHRAE 62-89 standard.**

| Application | Ventilation Rate/person | Application |
|---|---|---|
| Office space | 20 cfm | Smoking Lounge |
| Restaurants | 20 cfm | Beauty Salon |
| Bars/Cocktail | 30 cfm | Supermarkets |
| Hotel Rooms | 30 cfm/room | Auditorium |
| Conference Rooms | 20 cfm | Classrooms |
| Hospital Rooms | 25 cfm | Laboratory |
| Operating Rooms | 30 cfm | General Retail |

*Source : ASHRAE Standard 62-1989*

**much higher latent and sensible loads on the cooling and heating equipment.**

**Recommended IAQ guidelines result in**

- **Improved Indoor Environment**

**But**

- **Higher Utility Bills**

This translates in two ways.

**an improved work environment for employees and guests.**

**but significant higher utility bills for buildings.**

Thus, Indoor Air Quality (IAQ) and energy conservation have become the fundamental design goals of HVAC designers.

***There have been changes in the air!*** The rules have changed for the way the buildings/hotels have to be designed and built. The demonds for stringent indoor air quality, additional fresh air ventilation, concerns about humidity and microbial contamination and the need to find non toxic replacements for CFCs have posed a challenge to the technical creativity and design finesse of the engineers, to find solutions to these needs.

The **new generation of Treated Fresh Air Units** have remarkably successfully addressed the market needs of the 90's and has integrated the task of providing indoor air quality with efficient use of energy.

**The TFA incorporating Energy Recovery Devices also known as Energy Recovery Ventilators or Fresh Air Pre-conditioners.**


These Treated Fresh Air Units incorporating Energy devices or TFAs as they are commonly known as, provide many answers to the challenges faced by the designers today. They not only meet the need of the 90's but also the next millennium.

TFAs are typically used for treating/preconditioning ventilation air i.e. fresh air as well as far achieving acceptable IAQ, Humidity control, Energy conservation/efficiency, and in the process reducing the building envelope.