

# ▶ FOCUS INDOOR AIR QUALITY FOCUS ◀

## The Air That We Breathe

by Elia M. Sterling

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The quality of air as perceived by tenants of office and commercial buildings has been a growing concern over the last 20 years. Thousands of buildings have been investigated throughout North America and Western Europe due to indoor air quality complaints (IAQ); however, few serious IAQ problems have been identified.

In fact, consider the findings of a recent survey which polled 858 persons working in commercial buildings throughout the United States. When asked to assess the quality of air in their buildings, the vast majority of respondents gave their buildings positive rates. Only 9% rated the air where they work as being poor (source: BOMA, 1995).

For a better understanding of the

types of concerns expressed by building occupants, the accompanying table summarizes the results from 1,891 IAQ investigations conducted by the National Institute of Occupational Safety and Health in the United States (NIOSH) and Health and Welfare Canada (HWC sources: NIOSH, 1989; Kirkbride et al., 1990, respectively).

The findings of the U.S. and Canadian agencies are remarkably similar. In over 50% of investigated buildings, inadequate ventilation was identified as the primary cause of IAQ complaints. The term 'inadequate ventilation' refers to a range of HVAC-related inadequacies, such as lack of outside air, poor air distribution, poor thermal control and inadequate main-

tenance procedures. Clearly, ventilation problems have been demonstrated to be the major cause of building occupants' IAQ concerns.

These ventilation problems have historically been linked to misguided energy management practices that were commonly applied in the 1970s,

### Causes of IAQ Complaints in 1,891 White-Collar Work Places

Investigated by North American Government Agencies

Problem Type	NIOSH - 529 Buildings		HWC - 1,362 Buildings	
	Number	Percent	Number	Percent
Inadequate ventilation	280	53	710	52
Indoor contaminants	80	15	165	12
Outdoor contaminants	53	10	125	9
Building fabric	21	4	27	2
Biological contamination	27	5	4	0.4
Unknown	68	13	329	24

including shutting off outdoor dampers and adjusting thermostat settings outside of normally accepted comfort conditions.

The concerns that building occupants have expressed, related to indoor air quality problems, have been primarily about comfort conditions. While occupants have reported symptoms such as headaches, fatigue, and eye, nose and throat irritation, there is no widespread serious health impairment that has been linked to IAQ.

In 1983, the American Society of Heating, Refrigeration and Air-Condition Engineers (ASHRAE) - the organization primarily responsible for setting ventilation, air conditioning and energy management standards - convened a committee to develop an

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## The Air We Breathe (cont'd from page 6)

Indoor Air Quality Standard. The committee brought together representatives from divergent groups for a common cause: to improve IAQ and building occupant comfort.

The immediate result of this effort was ANSI/ASHRAE Standard 62-1989, "Ventilation for Acceptable Indoor Air Quality". This ventilation standard, which took effect in 1989, was a carefully crafted response to tenant IAQ concerns. The standard's primary emphasis was, and continues to be, on the provisions of sufficient ventilation to the occupied space, to dilute both occupant-generated contaminants as well as contaminants emitted by other sources, such as building materials and office equipment. The key is sufficient ventilation, not over-ventilation leading to energy management problems.

The standard sets a minimum outside air ventilation rate of 15 cubic feet per minute (cfm) per person to accomplish this objective. The standard also recognizes that some

spaces, such as office areas and restaurants, require slightly more ventilation air due to higher occupant densities, while other spaces, such as copy rooms and smoking lounges, require significantly more ventilation air due to the presence of strong contaminant sources. Standard 62-1989 has been in place for seven years and all reports indicate that it has been a successful solution to IAQ concerns.

Occupational health regulations administered by provincial Workers' Compensation Boards across Canada are demanding ever-increasing ventilation rates to provide comfortable conditions. In BC, WCB is proposing minimum outdoor air ventilation rates of 35 cfm per person, compared to the current ASHRAE requirement of 15 cfm per person.

Paul LaBranche, Executive Director of BOMA BC, comments, "The WCB is proposing unacceptable regulations in spite of all the evidence that a responsive marketplace is providing good air quality in-line with the ASHRAE ventilation standard." If the WCB regulations proposed in BC are adopted, there will likely be a

ripple effect across Canada, causing the cost of heating and air conditioning in buildings to increase drastically.

On the other hand, a new ASHRAE ventilation standard (62R) will be published for public review in August, 1996. This revised standard is a result of criticism by the energy engineering community in that the current ventilation rates recommended in Standard 62-1989 are too high and cause excessive energy use. If adopted, the new ventilation standard would reduce ventilation rates by as much as 50% - from 15 cfm per person to less than 7 cfm per person. The new standard will apply to all existing buildings as well as to new construction.

The result will be a "catch-22" situation for building owners and operators. With Canada's National Energy Code coming into effect this year, the Building Code will ensure that ventilation systems only provide the minimum requirements of 7 cfm per person. This reduced ventilation rate will not be sufficient to meet the WCB ventilation requirement of 35 cfm per person.

It appears that the most effective approach for prudent building owners and operators is to comply with the time-tested ventilation Standard 62-1989, "Ventilation for Acceptable Indoor Air Quality". Public review comment periods for both the BC WCB Proposed Indoor Air Quality Regulations and the proposed new ASHRAE ventilation standard 62R will be announced shortly. This commentary period is a valuable opportunity for the building industry to voice its concern and endorse a continued application of the ANSI/ASHRAE Standard 62-1989. *Elia M. Sterling is President of Theodore D. Sterling and Associates. With over 20 years of service to the building industry, he has conducted indoor air quality assessments encompassing over 40 million square feet of space.*

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