

Work **Safe!** Bulletin

INDOOR AIR QUALITY

Bulletin No.: 141
September 1991

INDOOR AIR QUALITY (IAQ) has become a significant environmental issue. Numbers of IAQ-related complaints have risen along with increased building tightness, growing use of synthetic materials, increased pollution of outdoor air, and energy conservation measures that result in recirculation of stale, inside air. Cleaning products and modern office equipment such as photocopiers and laser printers, can also increase the level of indoor air contamination. When IAQ problems affect building occupants, the term **SICK BUILDING SYNDROME** is often used to describe the situation.

Relative to Workplace Safety & Health concerns, IAQ refers to indoor air quality in non-residential workplaces that have no internal industrial processes or operations affecting the comfort or health of the occupants. Most concerns may be resolved by contacting the building superintendent, the safety and health committee or worker representative.

'Indoor environment' involves the interaction of workstations, outdoor climate, building systems, potential contaminant sources and building occupants.

An IAQ problem may develop if there is:

- * an indoor or outdoor source of contamination,
- * a heating ventilating air conditioning (HVAC) system that is not able to control air contaminants or ensure building comfort,
- * a pathway between the contaminant source and the occupants.

A variety of indoor and outdoor sources affect IAQ, and are described in the "Common IAQ Factors" on page 2.

Experience has shown that it is not always necessary to take measurements of air contaminants in order to resolve most IAQ problems. An initial assessment and walkthrough of the building or affected area in most cases can identify the problem.

The intent of the initial assessment is to obtain as much background information as is practicable on the building itself, and on the kind of symptoms occupants have been experiencing over a given time period.

The investigator should:

- * review mechanical and floor plans to determine the operation of the HVAC system and to identify HVAC zones;
- * review any documents available concerning the history of the building, including modifications, particularly recent ones, and any previous complaints related to health and comfort; and
- * identify all possible pollutants, locate their source, assess the effectiveness of the HVAC system, and define the nature and severity of the complaints.

In some IAQ cases, a more detailed assessment of the indoor environment may be required but information collected during the initial walkthrough will be of value when an experienced investigator performs a more detailed evaluation of the building.

Questionnaires may be used to assemble data related to the operation of the building as well as information related to complaints and medical information related to the complainants. While questionnaires can provide useful information, they must be designed and interpreted by trained persons to be of any value.

COMMON IAQ FACTORS

biological matter: stagnant water (HVAC), wet and damp material, humidifiers, condensation pans.

carbon dioxide: people breathing, combustion from gas or oil furnaces, heaters.

carbon monoxide: car and truck exhaust (garages, loading docks), tobacco smoke.

formaldehyde: unsealed plywood or particle board, urea formaldehyde foam insulation, fabrics, carpets, furnishings, copy paper.

particulates: tobacco smoke, air inlets, paper, duct insulation, water residue, unvented heaters.

volatile organic compounds: copy and printing machines, carpets, furnishings, cleaning materials, tobacco smoke, glue, adhesives, caulking, perfumes, hair spray, solvents.

inadequate ventilation: energy-saving and maintenance measures, improper system design or procedures, occupant intervention, poor office layout, insufficient outside air, insufficient airflow, insufficient circulation.

temperature and humidity extremes: fault in placement of thermostats, uncalibrated thermostats, poor humidity control, inability of the building systems to compensate for climate extremes, tenant-added office equipment and processes