

Indoor Air Quality and Mold

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When I was given the privilege to make a presentation at the recent NWDA Summer Meeting in Hershey, PA on the subject of indoor air quality and mold, many thoughts ran through my mind as to how to approach the subject. Should I use scare tactics as I have heard in numerous presentations at other association meetings by building scientists and lawyers? Do I emphasize that our window industry is more exposed to the mold concern than we realize? Should I remind the audience of window manufacturers, fabricators and suppliers about the importance of proper installation? Should I point out that the insurance industry is making it very difficult to obtain proper coverage for mold and mildew? Would it be advisable to recommend that our industry keep abreast of building codes being altered because of the concern for mold? Well, I did it all plus point out the seriousness of the exposure to our industry of this nightmare.

Let me point out some of the data I used in developing the presentation.

Natural controlled ventilation is often ignored when homes and buildings are designed. It is important that architects, property developers both commercial and residential, designers, engineers and the general public be aware of guidelines (readily available) for proper indoor air quality. Mechanical engineers should realize that introducing supplemental fresh air ventilation into heating, ventilating and air conditioning (HVAC) systems aids in improving indoor air quality and often maximizes the efficiency of the HVAC systems. In addition to air leakage present in every building, the supplemental fresh air ventilation mentioned above is maximized through the use of devices installed in windows that provide an alternative to merely opening windows and/or doors for natural ventilation.

It is hard to pick up a newspaper or magazine these days without reading something about the environment, indoor air quality, tight construction, stale air, indoor pollution and now the greater concern of mold and mildew. The concept of additional natural, background or passive ventilation into tightly constructed buildings originated in Scandinavian countries more than twenty-five years ago. Building codes in the United States, Canada and in Europe address proper indoor air quality. There is a minimal impact on energy consumption using window applied ventilation devices. "Build Tight, Ventilate Right" is the best practice in construction.

MOLD- a word that causes shivers up and down human spines! The discovery of mold in a home or building is like hearing an emergency vehicle coming down your street; or seeing black flags appear in your dreams plus having monsters appear. One of the conditions that contributes to mold growth is condensation both seen and hidden- seen on glass in window openings and hidden in walls until mold appears. Of course, any source of moisture can cause mold growth. Merely being in a building and performing daily activities such as breathing, bathing, washing clothes and dishes produces moisture in the indoor environment. Excessive humidity, either natural or mechanically produced is a dreaded condition producing harmful effects of condensation. One only has to consult the Old Testament in the book of Leviticus, Chapter 14:33, to learn how long humans have

had to contend with mold growth. Ventilation that helps dry up condensation is a positive aid to reducing the possibility of mold growth.

For many years prior to the energy crisis of the early 1970s, natural air infiltration or leakage was not a consideration when designing and constructing homes and buildings. Energy required for heating and air conditioning was plentiful and inexpensive. Needless to say, the situation has changed extensively. Architects, designers, mechanical engineers, property developers and homebuilders can no longer ignore the need for tightly constructed buildings, thus conserving energy. However, there now becomes a dilemma- how to construct tight buildings and still address proper indoor air quality. The American Society of Heating and Refrigeration Engineers (ASHARE) in a number of their publications indicate that fresh air should be introduced by opening windows and/or doors. An open window or door is uncontrolled natural ventilation causing increased energy consumption.

The Washington State Building Code Council adopted the Washington State Ventilation and Indoor Air Quality Code in 1991. It is a residential code that has been revised over the years and now has a 1999 version. Part of the section entitled "Whole House Ventilation Systems" reads as follows: 'Whole house ventilation systems shall supply outdoor air to all habitable rooms through individual outdoor air inlets, force-air heating system ducting or equivalent means. Doors and operable lites in windows are deemed not to meet the outdoor air supply intake requirements.' There are similar codes in existence for commercial and multi-family buildings in both Washington State and Oregon. Other codes that are mechanical system oriented can be found in Canada and in Minnesota and Vermont. Ventilation codes also exist in France and Scandinavian countries. It is unfortunate that similar codes are not in force in many more states in America and in other countries throughout the world.

As mentioned before, opening windows and doors is an often-recommended solution to improved indoor air quality. Not only do open windows and doors effect energy consumption but also violate the security of a building. Law enforcement agencies point out that a window or door merely unlocked compromises the security of a home or building. Individual outdoor room air inlets as specified in the Washington State Ventilation and Indoor Air Quality Code maintain complete security while still allowing fresh air to circulate. The individual outdoor room air inlets can be left open even when homes or buildings are unoccupied. In addition, these devices have screening to prevent the entry of insects.

Pardon the repetition but it is important to again point out that a combination of mechanical and natural ventilation will not only improve indoor air quality but also help to reduce unwanted condensation. Newer construction techniques, i.e. "build tight", typically reduces natural ventilation. Having adequate natural ventilation will contribute to reducing the possibility of mold growth.

CONCLUSIONS

- o Builders are constructing tighter homes and buildings to reduce energy costs often sacrificing needed controllable natural ventilation.
- o Tight construction creates excess moisture inside a home or building causing

- undesirable condensation to form on glass, in windows as well as hidden in walls.
- o A family of five can generate as much as 3-1/2 gallons of moisture per day.
 - o Ideal humidity levels range from 30 to 45%- any higher may cause condensation.
 - o Opening windows and doors for natural ventilation causes drafts and increases the need as well as the cost of energy.
 - o Individual outdoor room air inlets in combination with low capacity exhaust fans is a proven method of natural ventilation to remove excess moisture, reduce condensation and help alleviate the possibility of mold growth.
 - o The window industry must recognize its exposure to litigation related to mold and mildew.
 - o Proper installation is one of the keys to prevent the possibility of moisture intrusion around windows.