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Steel Framing Alliance™

Steel. The Better Builder.

MOLD: ONE MORE REASON TO BUILD WITH STEEL FRAMING

Danger lurks in buildings, where moisture can penetrate and accumulate on mold-susceptible materials. In this environment, mold spores can readily feed on nutrient sources and grow to adversely affect the air we breath - inside the building. While exposure to mold and resulting health effects are not well documented, the understanding that mold and mycotoxins can help trigger illnesses ranging from allergies to lung cancer among inhabitants is clear.

Consequently, this highly controversial subject continues to instigate increasing litigation, insurance rates, health care costs, not to mention huge remediation costs and loss of income. What we are left with is not only a massive clean-up, but a massive public outcry for better constructed buildings.

Bottom line: If we build mold-resistant structures, we will live and work in healthier environments. Doing that must be practical and economically feasible, using the knowledge and technology we have today.

What is Mold?

Mold is a fungus, with tens of thousands of known strains in construction environments, which produce tiny spores to reproduce on surfaces such as wood, paper, carpet and foods. Mold spores are rampant in the air, both indoors and outdoors, a fact that cannot be changed. But when excessive moisture, sufficient food source, temperature, and other factors are present, mold can grow, and digest whatever it grows on to survive.

While there is no practical way to eliminate all mold and mold spores in the indoor environment, there is a way to control it. In order to grow, mold needs a nutrient source, appropriate temperature, and moisture. First, let's consider moisture – the biggest culprit.

Moisture & Mold Growth

For mold to grow in buildings, sufficient moisture is required for a period of time. Three primary factors influence the amount of moisture available for mold growth:

- Building tightness – not allowing moisture to escape to the outside,
- Liquid water moisture infiltration from the outside due to leaky window/door openings, leaky roofs, no flashing, blocked gutters, foundation leaks, plumbing leaks, and
- Condensation on mold susceptible materials, resulting from water vapor begun inside or outside the building.

Tight Buildings

For the last 30 years, buildings have been constructed with new materials and production techniques, including thermal insulation, mechanical HVAC (heating, ventilation and air conditioning) systems, etc., to "tighten them up" in order to save energy. Efforts to be more energy conscious have proven successful. The total number of commercial buildings and amount of occupied commercial floor space has dramatically increased since 1979, but total energy consumption has remained flat.

Interestingly enough, this energy-saving trend also spurred on an increase in moisture levels, in terms of relative humidity, inside the building. As buildings became "tighter", the amount of air exchanged between the interior conditioned space and the outdoors diminished, resulting in significantly less dilution of moisture and indoor pollutants, such volatile organic compounds (resulting from some species of mold), even carbon dioxide.

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BUILD MOLD-RESISTANT HOMES WITH STEEL

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Leaky Buildings

Additionally, construction flaws, or simply older, less maintained buildings, can permit the presence of unwanted moisture inside. Leaks occur most often around window and door openings, from the roof, because of missing or inadequate flashing, or blocked or missing gutters. Water may also come from foundation leaks, plumbing leaks, and a host of other sources.

When small cracks or openings are located in the drainage path, large amounts of water can pass through. Typically cracks occur at critical junctures like the base of window openings, or roof and wall intersections, where they can do the most damage. Regardless of the cause, unwanted water infiltration must be prevented to control the growth of mold.

Mold-Susceptible Materials

Beyond leaks, water present in organic building materials at the construction site is a recipe for mold disaster. For example, wood framing, OSB, and gypboard wet from rain can provide ideal conditions for mold growth once the materials are installed.

Other hosts for common indoor molds include building and material substrates like window sills, walls, carpets, textiles, wood, wallpaper glue, house dust, soil, paper, paint, and food. Many of the mold types are fast growers on organic materials that provide a nutrient source with enough water and the right temperature.

Building Mold-Resistant Structures with Steel

Now that we've loosely defined mold and described ideal environments for mold growth, let's consider how today's steel framing construction technology can help mitigate the instance and growth of mold in buildings.

First, structures must be built so that there is adequate ventilation, while allowing for controlled environments inside the building to be safe and energy efficient. Buildings must also be constructed to prevent the infiltration of water, by resisting sagging and other structural changes that may produce cracks and crevices in the building envelope. And, the construction industry should use materials that limit the sources of food for mold.

Steel framing is one important way to build homes and non-residential buildings that can help resist the onset and growth of mold. Steel framing members are dimensionally straight and connected mechanically (screwed vs. nailed) offering a tight envelope with no nail pops or drywall cracks (e.g. where the roof meets the walls). Thus, the building structure is a stronger and more resilient. Ventilation is efficiently built into the design, and energy efficiency is maintained or increased due to steel's inorganic properties. Moisture does not get into steel studs, substantially eliminating the expansion and contraction of construction materials around windows and doors, where leaks can occur. And steel does not provide a food source for mold to grow.

With steel framing technology, building components are often built off-site, in a controlled environment, and then erected on the job site. Processes of building with steel framing have become so efficient and economically feasible that builders are choosing to use steel alone or with other building components such as wood, cement, insulated concrete forms, among others.

Because steel is non-combustible, not to mention mold-resistant structures, it enjoys a majority of the market share in interior walls in non-residential construction, and recent significant increases in floors and walls in residential construction. As we get smarter in building design and construction, uses of light gauge steel framing will continue to grow. And mold, and the adverse effects it creates in our indoor environments, should not.

For more information about mold in the built environment, visit the U.S. Environmental Protection Agency, www.epa.gov, or HealthyHome.com, www.healthyhome.com, or the Foundation of the Wall and Ceiling Industry, www.awci.org. For more information about steel framing, visit the Steel Framing Alliance, www.steelframingalliance.com.

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