



Mold Issues with ICF Walls

Characteristics of Mold

Mold development in residential and commercial construction is a common problem that is gaining more prominence because of greater concerns about how it affects the health of building occupants. People are exposed to mold every day, because it is virtually impossible to create a space that is mold free. Mold releases spores, or invisible seeds that are carried through air and water. When these spores land on a damp, moist base that has food and oxygen available they will start to grow. Mold is a type of fungus that decomposes dead organic material such as leaves, wood and plants. Individual mold colonies are too small to be seen without a microscope, and the color varies according to the food source and the mold's age.

The Effects of Mold

Prolonged exposure to mold can lead to the development of allergies in susceptible people. It can worsen chronic asthma in those who already suffer from it, and it can cause infections in individuals with suppressed immune systems and certain types of cancer and organ transplant patients. Mold also causes property damage, because it feeds on organic material, like wood and paper, and decomposes it.

Mold in Wood Frame vs. ICF

Mold has four requirements in order to grow and survive –food, oxygen, temperatures between 40 and 100 degrees F, and water or moisture. Oxygen and temperatures between 40 and 100 degrees are necessary in both wood frame and ICF buildings, so ICFs provide no mold prevention advantage in those two areas. However, ICFs provide a real advantage when it comes to the required food and moisture.

Food

In a wood frame structure, mold can find food sources in the wood, the paper facing of gypsum drywall and other wood materials, all of which are the dead organic material on which it thrives. The mold will decompose the wood making nutrients available for it to grow. By contrast, an ICF wall assembly consists of two inorganic types of material –EPS and concrete. Because the ICF walls are inorganic, the food source for mold is eliminated, and it has lost one of the four requirements for its survival. Although most structures contain organic material, such as wood or the paper on the drywall, eliminating a food source for mold in the exterior walls puts ICF walls at a definite advantage compared to wood frame walls.

AMERICAN POLYSTEEL, LLC
INSULATING CONCRETE FORMS

6808 ACADEMY PARKWAY EAST, NE • BUILDING C-2 • ALBUQUERQUE, NM 87109
800-977-3676 • PHONE (505) 345-8153 • FAX (505) 345-8154 • www.polysteel.com

Moisture

Since oxygen will always be present, a food source will always be available, and indoor temperatures will generally be between 40 and 100 degree F, controlling moisture is the only effective strategy for preventing mold growth in buildings. And here ICF walls provide the greatest advantage over other types of wall systems.

Controlling Humidity

To prevent the development of mold in a building, it is essential to keep it dry. Since ICF walls create a virtually airtight building envelope, it is easier to control the humidity and moisture in an ICF structure than in other types of structures. Indoor air moisture comes from outdoor air, bathing, cooking and breathing. It is recommended to keep the relative humidity of the building below 50%. There are several ways to control humidity and prevent the growth of mold inside a structure:

- Using exhaust fans in kitchens and bathrooms
- Venting air from the clothes dryer to the outside of the building
- Avoiding the use of humidifiers
- Preventing moisture or water leaks in walls, roofs, windows, basement walls and plumbing pipes
- Using good basement wall water sealant and drainage practices, such as detailing, flashing and detailing around doors, windows and penetrations

One of the easiest ways to control and remove the humidity is to correctly size the mechanical HVAC system. It is critical that the higher R-value, low air infiltration and thermal mass that ICF walls provide is accounted for in the sizing of the mechanical system. An HVAC system that is too large will not remove humidity adequately.

Preventing Air Infiltration

Typical wood frame construction will achieve a condensation point within the wall assembly, because there is no thermal mass, and the wall is not insulated on the exterior and interior faces. Once the condensation point is reached within the wall assembly, moisture collects. If the wood frame wall assembly has vapor and air barriers, the moisture can't escape. Therefore, mold spores have both the food source (wood) and the moisture on which to grow.

ICF walls create a solid monolithic wall with no cavities like those found in metal or wood frame construction. Moist air, combined with a large temperature differential, causes condensation or moisture to collect. Since there are no cavities in an ICF wall, there is no air circulation within the walls. In addition, the concrete in the ICF wall acts as thermal mass that is insulated on both sides, creating a consistent temperature barrier between the outside and inside air temperatures.

Finally, although the EPS in ICFs is not an impermeable material, it is closed cell polystyrene foam that has a high degree of resistance to moisture absorption. With ICF construction, you can easily control the humidity and air infiltration, and therefore prevent the development of mold. ICF walls reduce the possible health risks and property damage resulting from mold.