

Dew Point and Condensation

What is a Dew Point?

A dew point is the temperature at which water vapor in the air begins to condense. Water vapor does not harm wood framing or other wall components. It is only after water vapor is condensed into a liquid form that it can begin to cause damage to your home.

Why does water vapor try to move into the wall cavity?

Water vapor always moves from warm air towards colder air because warm air holds more water vapor (and therefore has higher vapor pressure). Nature always tries to equalize pressure differences. So in the winter, water vapor from the warm interior of a home tries to move toward the colder exterior. Then in summer it reverses, and water vapor moves from the hot, muggy exterior to the cool, dehumidified interior of the air-conditioned home.

Where does water vapor condense?

In walls, water vapor condenses on cold surfaces. If the temperature of a surface is colder than the dew point temperature (such as OSB sheathing or studs in the winter), water vapor will condense on that surface. If the temperature of the surface is warmer than the dew point temperature, such as a Fullback® Thermal Support System product, the water vapor will not condense. Good examples are the hot and cold water pipes in a home. On a warm, humid day, water vapor will condense ("sweat") on the cold water pipe, because the temperature of the pipe is colder than the dew point temperature. However, water vapor will not condense on the warm water pipe, because the temperature is warmer than the dew point temperature.

How does water vapor move through the wall?

Water vapor moves through the wall in two ways: by vapor diffusion and by air leakage. Diffusion is the relatively slow movement of water vapor directly through the wall components. Air leakage is the flowing of humid air into the wall cavities through cracks and holes in the wall components, such as the cracks around window frames, holes for piping, electrical outlet boxes, etc. It is important for you to recognize that air leakage conveys much more water vapor than diffusion. A good example is a canvas bag filled with water. Water will slowly seep through the bag, similar to diffusion. But if a hole is made in the bag, the water will rapidly pour through the hole. The Fullback panels clearly reduce air leakage and at the same time permit diffusion. Fullback has a perm rating of 5.0. A perm rating lower than 1.0 is considered a vapor barrier.

Warm Wall

The addition of Fullback to the exterior envelope of your home will warm the wall cavity...keeping the wall cavity warmer will reduce the chance of condensation.