What is Vapour Drive?

Vapor drive moves water vapor from areas of high concentration to low concentration. Vapor drive naturally diffuses moisture vapor into and through wall structures, resulting in condensation on cool surfaces. To understand how air barriers and insulation impact building comfort and integrity, it is critical to understand how moisture vapor interacts with wall structures.

The degree of vapor drive is controlled by the porosity of the wall and moisture and temperature gradients. Moisture vapor moves naturally from a region of high vapor concentration to an area of lower concentration, until the concentration equalizes. If vapor pressure is high inside the wall and low outside the wall **(Manitoba winter)**, vapor drive will be directed outward. The greater the difference in vapor pressure, the greater the vapor drive.

Moisture vapor will naturally move from the warm side of a wall to the cooler side. If the temperature is high inside the building and lower outside the building, vapor drive will be directed outward. **(Manitoba winter)**. The greater the difference in "temperature gradient," the greater the vapor drive.

The movement of moisture via diffusion is a result of differences in vapor pressure that are related to the temperature and moisture content of the air. **Temperature is the greater factor affecting vapor drive.** In fact, when the temperature differences between indoors and outdoors is greater than 15°C, vapor drive can be quite strong. **(Manitoba, spring, fall and winter)**. Add a significant difference in humidity, and the vapor drive becomes even stronger.

Understanding vapor drive provides insight and direction in helping achieve the desired performance of the wall assembly as well as placement of the permeable or non-permeable air barrier.

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