



# Advanced Housing Research Center



Forest Products Laboratory  
Madison, Wisconsin

Tips and  
Techniques

## Controlling Moisture in Homes

Energy-efficient construction techniques that emphasize low levels of air leakage have increased the potential for moisture problems in homes and other light-frame buildings. In addition, excessive moisture in wall cavities can decay the wood if the moisture remains for extended periods at temperatures greater than approximately 50°F. However, recent research at the Forest Products Laboratory (FPL) has shown that short periods of moderate condensation in walls during cold winter periods do not necessarily lead to permanent damage.

During the winter in cold climates, high levels of indoor humidity can lead to serious moisture problems in walls and windows. Excess humidity is caused by people, plants, showering, cooking, and a lack of adequate ventilation. Damp basements or crawl spaces or a leaky roof can add to this moisture.

Maintaining a reasonable level of indoor humidity (about 40% or less) is the most effective method of moisture control. This can often be accomplished with minimal heat loss using exhaust fans in the kitchen and bathrooms or a central ventilation system. Another option that reduces heat losses but maintains sufficient ventilation is an air-to-air heat exchanger. Dehumidifiers can also lower indoor humidity in areas with a milder and more humid winter, but they are generally designed to operate at temperature and humidity levels too high to be practical in cold winter climates.

Continuous vapor retarders play an important role in preventing condensation in walls and ceilings. Vapor retarders should be applied to the warm side of insulated floors, walls, and ceilings. However, they have little effect on indoor humidity because vapor transmission through walls and ceilings is often a small part of the total moisture exchange in the house.

In warm southern climates, the problem results from moisture coming into the house from the outside rather than a too high indoor humidity. To remedy these situations, the design of the wall-placement of a vapor barrier and amount of insulation are key factors. The wall design depends on the outdoor relative humidity and temperature during both summer and winter.

At FPL, studies on appropriate moisture management are underway, which should help builders and homeowners alleviate many home moisture problems.

