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Moisture Problems in Attic and Wall Cavities of a Home

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USING A VAPOR BARRIER

Vapor barriers prevent house moisture from entering ceiling insulation where it is likely to condense and cause moisture problems. A vapor barrier should always be placed over the side of the insulation which is closest to the ceiling.

If you use batt-type insulation, use one with a vapor seal built in. Fill-type insulation that is blown in place should have a polyethylene vapor barrier laid between the ceiling joists first. Be sure to lap it 4 inches up on the side of each joint. Then blow or pour the insulation on top of the polyethylene.

For a one and one-half story house, ventilators must be installed so that the attic is uniformly ventilated. Provide space between the rafters and the sloping portion of the second floor walls so that air movement is adequate. Each installation must be planned carefully to accomplish good attic ventilation.

During winter in the Midwest, even when a vapor barrier is used at the bottom side of the attic insulation, a small amount of moisture vapor passes from the warm living area of the house through the ceiling into the cold attic. With no ceiling vapor barrier, much more water vapor passes through the insulation into the attic. Attic ventilation is needed to remove this moisture to keep it from condensing on cold surfaces in the attic, especially on the bottom of sheathing boards.

In the problem outlined at the beginning of this guide, the attic was insulated with R-24 insulation with a vapor barrier. However, the builder erroneously decided on no attic ventilation. Consequently, moisture passing from the warm living area through the ceiling into the cold attic was trapped. The relative humidity was above 90 percent, and moisture condensed on the bottom of sheathing boards, the tops of joists, and on other exposed lumber surfaces.

Louvers and vents were installed in accordance with the information and recommendations set out in this guide. This completely eliminated the problem.

Some blown-in or fill-type insulation is lightweight, and high winds may displace it around soffit ventilators. To prevent this, use R-24 batt-type insulation 24 inches wide around the edges of the attic (see Figure 1). This is more resistant to movement by the wind. If it is more convenient, use wood headers between rafters and ceiling joists at the outer edges of the ceiling joists to contain the fill insulation. In either case maintain a minimum of 1 inch of space below the sheathing boards for free air movement.

COLOR OF ROOF TO USE

Some builders like to use black shingles on the roof. Dark shingles conduct much more heat through the roof than white ones. If R-24 or more insulation is used and the attic is well ventilated as described here, this extra heat will have little effect on the lower surface temperature of the ceiling. So use any color shingles you like if the attic is properly ventilated and the ceiling is properly insulated.

MOISTURE IN THE WALL CAVITY

Condensation problems in wall cavities develop when moisture from the warm moist air moves into the wall cavity in the form of vapor. It condenses on the insulation near the outside surface or on any other cold surface. In nearly all newly constructed homes, moisture in wall cavities is avoided by installing a vapor barrier on the warm side (inside) of the wall insulation. This vapor seal is built into most batt-type insulation.

A newer batt insulation is one without a vapor seal or any covering at all. It is cut in blocks, fits snugly between the studding, and completely fills the cavity between the studs. The vapor barrier is provided by stapling a clear polyethylene sheet on the inside of the stud. After its insulation has been installed, installation of electrical wiring, plumbing, heat ducts, etc., should be completed before the vapor barrier is installed so that the wall board or paneling can be immediately applied to protect the vapor barrier from damage.

When you're remodeling an older house, and insulation is blown into the wall cavities, applying a vapor barrier on the warm side of the insulation may be difficult. If the inside of the wall finish is smooth plaster or wall board, a good vapor barrier can be provided by two coats of aluminum paint and spar varnish (1/2 and 1/2) covered with two coats of decorative paint.