

# Housewrap



FEMA



HOME BUILDER'S GUIDE TO COASTAL CONSTRUCTION FEMA 499/August 2005 Technical Fact Sheet No. 23

**Purpose:** To explain the function of housewrap, examine its attributes, and address common problems associated with its use.

## Key Issues

- Housewrap has two functions: to prevent airflow through a wall and to stop (and drain) liquid water that has penetrated through the exterior finish.
- Housewrap is not a vapor retarder. It is designed to allow water vapor to pass through.
- The choice to use housewrap or building paper depends on the climate and on specifier or owner preference. Both materials can provide adequate protection.
- Housewrap **must** be installed properly or it could be more detrimental than beneficial.

Proper installation, especially in lapping, is the key to successful housewrap use.



## Purpose of Housewrap

Housewrap serves as a dual-purpose weather barrier. It not only minimizes the flow of air in and out of a house, but also stops liquid water and acts as a drainage plane. Housewrap is not a vapor retarder. The unique characteristic of housewrap is that it allows water vapor to pass through it while blocking liquid water. This permits moist humid air to escape from the inside of the home, while preventing outside liquid water (rain) from entering the home.

## When Should Housewrap Be Used?

Almost all exterior finishes allow at least some water penetration. If this water continually soaks the wall sheathing and framing members, problems such as dryrot and mold growth could occur. Housewrap stops water that passes through the siding and allows it to drain away from the structural members. In humid climates with heavy rainfall, housewrap is recommended to prevent water damage to the framing. Use in dryer climates may not be as critical, since materials are allowed to adequately dry, although housewrap also prevents air movement through the wall cavity, which is beneficial for insulating purposes.

## Housewrap or Building Paper?

To answer this question, it is important to know what attributes are most important for a particular climate. Five attributes associated with secondary weather barriers are:

- **Air permeability** – ability to allow air to pass through
- **Vapor permeability** – ability to allow water vapor (gaseous water) to pass through
- **Water resistance** – ability to prevent liquid water from passing through
- **Repels moisture** – ability to prevent moisture absorption
- **Durability** – resistance to tearing and deterioration

As shown in the following table, the climate where the house is located determines the importance of the attribute.

Product Attribute Rating		Poor – Fair – Good – Excellent	
Attribute	When It Is Important	Product Performance	
		Building Paper	Housewrap
Air permeability	Windy and cold climates	Fair	Good
Vapor permeability	Hot, humid climates	Fair	Good
Water resistance	Windy and rainy climates	Good	Excellent
Repels moisture	High rainfall	Good	Good
Durability	Windy, with possible extended exposure	Fair	Good
Cost	Owner preference	Excellent	Fair

**In general, housewrap is a good choice for coastal homes.**

## Installing Housewrap

No matter what product is used (housewrap or building paper), neither will work effectively if not installed correctly. In fact, installing housewrap incorrectly could do more harm than not using it at all. Housewrap is often thought of and installed as if it were an air retarder alone. A housewrap will channel water and collect it whether the installer intends it to or not. This can lead to serious water damage if the housewrap is installed in a manner that does not allow the channeled water out of the wall system. The following are tips for successful installation of housewrap:

- Follow manufacturers' instructions.
- Plan the job so that housewrap is applied before windows and doors are installed.
- Proper lapping is the key – the upper layer should always be lapped over the lower layer.
- Weatherboard-lap horizontal joints at least 6 inches.
- Lap vertical joints 6 to 12 inches (depending on potential wind-driven rain conditions).
- Use 1-inch minimum staples or roofing nails spaced 12 to 18 inches on center throughout.
- Tape joints with housewrap tape.
- Allow drainage at the bottom of the siding.
- Extend housewrap over the sill plate and foundation joint.
- Install housewrap such that water will never be allowed to flow to the inside of the wrap.
- Avoid complicated details in the design stage to prevent water intrusion problems.
- When sealant is required:
  - use backing rods as needed,
  - use sealant that is compatible with the climate,
  - use sealant that is compatible with the materials it is being applied to,
  - surfaces should be clean (free of dirt and loose material), and
  - discuss maintenance with the homeowner.



## Avoid These Common Problems

- **Incomplete wrapping**

Gable ends are often left unwrapped, leaving a seam at the low end of the gable. This method works to prevent air intrusion, but water that gets past the siding will run down the unwrapped gable end and get behind the housewrap at the seam. Also, it is common for builders to pre-wrap a wall before standing it. If this is done, the band joist is left unwrapped. Wrap the band joist by inserting a strip 6-12 inches underneath the bottom edge of the wall wrap. In addition, outside corners are often missed.

- **Improper lapping**

This often occurs because the housewrap is thought of as an air retarder alone. When applying the housewrap, keep in mind that it will be used as a vertical drainage plane, just like the siding.

- **Improper integration with flashing around doors and windows** – See Fact Sheet No. 22.

- **Relying on caulking or self-sticking tape to address improper lapping**

Sealant can and will deteriorate over time. A lapping mistake corrected with sealant will have a limited time of effectiveness. If the homeowner does not perform the required maintenance, serious water damage could occur when the sealant eventually fails. **Therefore, do not rely on sealant or tape to correct lapping errors.**